

Special report gives status of the concrete tie today

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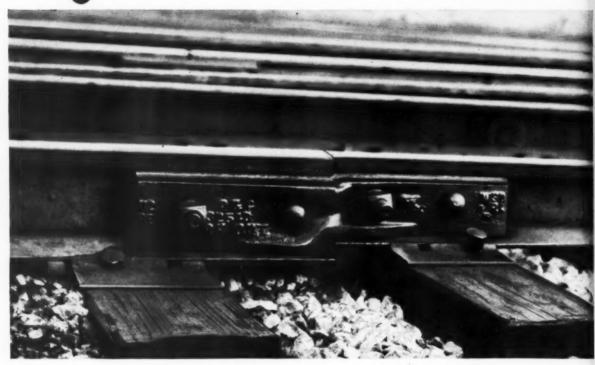
September 1961

## STRUCTURES

Output goes up with tamper modified for work in yards

A Simmons-Boardman TIME-SAVER Publication

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For the full story, all you need do is get in touch with the nearest Bethlehem sales office. Or write to us at Bethlehem, Pa. Bethlehem roof bolts are being installed in this 8-mile-long water tunnel near South Berlin, Mass. A 54-in. steel strap allows each pair of bolts to work as a unit and distributes the support over a large area of rock.





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RAILWAY TRACK and STRUCTURES

UCTU

#### STRUCTURES

#### SEPTEMBER

1961 • Vol. 57, No. 9

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Association news

#### Don't miss . . .

Once again staff editors will bring you the story of the Roadmasters' and Bridge & Building conventions. Pictures will show who was there and what they did. Text will give highlights of proceedings.

... in the October issue

# BALANCED BRAKING

Racor mechanical car retarders clasp each wheel individually for consistent braking regardless of wheel mounting variations

Consistent braking, dependable braking—that's the kind of braking you get every time with Racor mechanical car retarders. You get the same braking car after car because of Racor's exclusive balanced braking principle. Here's what this means:

First, each wheel is <u>clasped on both sides</u>. There's no force tending to press it off the axle, no force to crowd the flange against the running rail. The rugged Racor unit "floats" from side to side, gripping the wheel with the same pressure on the front and back.

Second, each wheel of a pair is clasped <u>independently of its mate</u>. Variations in wheel back-to-back distances have no effect on the Racor retarder's operation.

Third, less flange pressure. Improper adjustment of the Racor retarder cannot cause unusually heavy pressures against flange of wheel.

In yard after yard, Racor mechanical car retainers are eliminating skates, speeding operation and returning as much as 40% on their investment. Ask your Brake Shoe representative to sho you how they can help improve your yard operations. American Brake Shoe Company, Railros Products Division, 530 Fifth Ave., New York 36, N.

In Canada: Dominion Brake Shoe Company, Ltd.



Quality products cut your ton-mile cost

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unusi el. retare ration inves to sho l oper Railron 36, N.

Sixteen tracks of this yard employ Racor mechanical car retarders. Note that locations of retarders are staggered, so that the full length of each track can be used.



The Racor retarder clasps each wheel with the same pressure from both sides. This balanced braking gives consistent operation regardless of variations in wheel back-to-back distance. There is no excessive flange pressure or tendency to force the wheels apart on the axle.

# **Jainmont**HYDRAULIC TIE REMOVER

Removes ties fast...automatic pressure boost for severe conditions!

Fairmont's W68 Tie Remover delivers hydraulic pressure as needed to the tie for maximum speed and efficiency. An improved, double-pump hydraulic circuit provides an unusually fast ram stroke and return cycle with the medium pressure required to remove most ties. And the machine automatically boosts pressure by two and a half times when stubborn ones are encountered.

Designed for high-production tie gangs, the W68 Series B is self-propelled and requires only one operator. Both the ram head and rail hooks are positioned hydraulically. The machine is equipped with a built-in, manually adjusted shaver for plate-cut ties, and has a power-driven, removable point grinder. A set-off and turntable, both portable, are offered as extra equipment.

The W68 Series B Tie Remover is one of many high-efficiency Fairmont machines that speed tie-renewal programs, make maintenance-of-way dollars go miles farther. Call or write today for details on this equipment.

Fairmont equipment is available on lease.



W87 SERIES B TIE BED SCARI-FIER digs hard-packed, 10foot tie beds at one-a-minute speeds, is one-man operated.

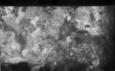


W84 SERIES B HYDRAULIC SPIKE PULLER lets one man work both sides of both rails, pull 15 to 20 spikes per minute.



W90 SERIES A TIE HANDLER does three jobs—removes, inserts and repositions ties. Two men operate it.







RAILWAY TRACK and STRUCTURES

UCTURE

September, 1961

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#### STRUCTURES NEWS ABOUT PEOPLE



B. H. Crosland



J. H. Brown



Henry F. Davenport Illinois Central



T. Dabney Kern Illinois Central



Clarence Baker Missouri Pacific



William H. Hobbs Missouri Pacific

ELGIN, JOLIET & EASTERN-Robert V. Dangremond, roadmaster at Gary, Ind., has been promoted to the newly created position of division engineer, Gary division, with headquarters at Gary. Mr. Dangremond is succeeded by Joseph P. Schramm, supervisor track at Gary, who is in turn succeeded by John R. Boyer, supervisor track at South Chicago, Ill. Mr. Bover is succeeded by Robert J. Massey, assistant supervisor track at Gary. Edward V. Paige, assistant roadmaster at South Chicago, has been transferred to Gary.

ERIE-LACKAWANNA-James K. Weikal, assistant division engineer at Hornell, N. Y., has been promoted to division engineer at Salamanca, N. Y., succeeding Walton E. Smith who has been transferred to Youngstown, Ohio. Mr. Smith succeeds Raymond J. Pierce who has been transferred to Hoboken, N. J. Mr. Weikal is succeeded by Robert O. Walter, office engineer at Cleveland, Ohio, who is in turn succeeded by Thomas R. Switala.

FRISCO-J. H. Brown, assistant chief engineer, Western district, at Springfield, Mo., has been promoted to chief engineer, also at Springfield, succeeding B. H. Crosland who has retired after more than 41 years of service. The jurisdiction of O. E. Fort, assistant chief engineer, Eastern district, also at Springfield, has been extended to include the Western district.

E. Eskengren, Jr., roadmaster at Springfield, has been promoted to assistant process engineer at the same location. D. F. Richardson, roadmaster at Chaffee, Mo., has been transferred to Springfield, succeeding Mr. Eskengren. Mr. Richardson is succeeded by J. H. Langston, assistant roadmaster at Tulsa, Okla.

ILLINOIS CENTRAL-Henry F. Davenport, staff engineer, Chicago, has been promoted to assistant to chief engineer there, succeeding Mark Block who has retired after more than 48 years of service. Mr. Davenport is succeeded by Thomas D. Wofford, Jr., engineer of design at Chicago, who is in turn succeeded by Roger E. Skinner, assistant engineer of design. T. Dubney Kern, office engineer at Chicago, has been promoted to assistant to chief engineer at the same location. Mr. Kern's previous position of office engineer has been abolished. John W. Lager, assistant engineer at Chicago, has been promoted to special engineer there.

MISSOURI PACIFIC-Clarence Baker, assistant chief engineer, St. Louis, Mo., has been promoted to chief engineer there, succeeding William H. Hobbs whose retirement was noted in the June issue.

NEW YORK CENTRAL—R. R. Monion, assistant vice president-operation and an engineer by training and experience, has been promoted to the newly created position of assistant to the president. In his new position, Mr. Manion will be responsible for the coordination of inter-departmental projects and execution of special assignments for the president.

PENNSYLVANIA-The following changes have occurred recently: D. R. Wolfe to assistant district engineer at Altoona, Pa.; J. E. Bullock, supervisor track at Akron, Ohio, to assistant engineer at Chicago; R. M. McGuire to general foreman-track at Corry, Pa.; C. D. Sheron to assistant engineer at Philadelphia, Pa.; W. R. Smith to assistant supervisor track at Jersey City, N. J.; W. W. Naylor to assistant supervisor track at Lewistown, Pa.; M. R. Phillips to supervisor track at New Kensington, Pa.; W. P. Pope to supervisor track at Monongahela, Pa.; E. P. Siravo to assistant supervisor track at Johnstown, Pa.; W. J. Buetz, supervisor track at Indianapolis, Ind., to assistant trainmaster and supervisor track at Decatur, Ill., and W. R. Mayer, supervisor track at Marion, Ind., transferred to Terre Haute, Ind.

SANTA FE-W. W. Toliver, division engineer at Winslow, Ariz., has been appointed office engineer at Los Angeles.

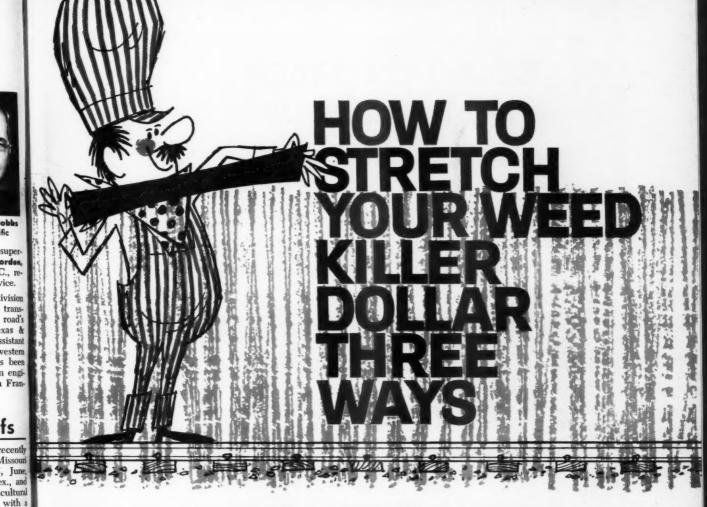
SOUTHERN-Norman M. Cary, general division engineer at Atlanta, Ga., has been promoted to assistant chief engineer, maintenance of way and structures, at Knoxville, Tenn., succeeding James M. Peek whose promotion to chief engineer, maintenance of way and structures, at Charlotte, N. C., was noted in the August issue. Mr. Carey is succeeded by Marvin E. Wilson, Jr., division engineer at Somerset, Ky. Don J. Cottrell, assistant track supervisor at Atlanta, Ga., has been promoted to track supervisor at Charleston, S. C. Norris S. Newton, student apprentice, has been promoted to track supervisor at Jesup, Ga. Charles F. Worden, office engineer at Washington, D. C., retired recently after 43 years of service.

SOUTHERN PACIFIC-R. E. Frame, division engineer at Ogden, Utah, has been transferred to San Antonio, Tex., on the road's lines in Texas and Louisiana (Texas & New Orleans). Robert A. Luthrop, assistant division engineer on the Northwestern Pacific, a subsidiary of the SP, has been promoted to senior assistant division engineer on the Southern Pacific at San Francisco, Calif.

#### Biographical briefs

William H. Hobbs, 69, who recently retired as chief engineer of the Missouri Pacific at St. Louis, Mo. (RT&S, June, p. 10), was born at Gatesville, Tex., and graduated from Oklahoma Agricultural and Mechanical College in 1912 with a Bachelor of Science degree in civil engineering. Mr. Hobbs commenced his railroad career in 1912 with the MP as a rodman, subsequently serving as instrumentman and assistant engineer. From 1919 to 1920 he served with the U. S. Army. He was promoted to engineer of design in 1924, engineering assistant to chief executive officer in 1936 and director of research in 1942. Mr. Hobbs was advanced to chief engineer at St. Louis in 1951

B. H. Crosland, 70, who recently at tired as chief engineer of the Friso at Springfield, Mo. (announced elsewhere on this page), was born at Rochester, N. Y. and received his higher education Valparaiso University. Mr. Crosland commenced his railroad career in 1908 as a chainman on the Canadian Pacific, working during summer vacation. During subsequent summer vacations he served chairman and rodman on the Buffalo, Rochester & Pittsburgh, now part of the Baltimore & Ohio, and the New York State, now abandoned. In 1914 he joined the Interstate Commerce Commission an instrumentman doing railway valuation work. From 1917 to 1919 he served with the U. S. Army Corps of Engineers. In (Continued on page 82)





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TRUCTURE

Want to learn more about stretching your weed killer dollar? Write today for complete information.

UREABOR® 31-New granular combination of 3 proven weed killers for dry application. Kills a greater variety of weeds, more effectively than any other herbicide on the market. One application keeps weeds down for a whole season. Effective control, plus low application rate and ease of application really stretch your weed killer dollar.

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Only U.S. Borax offers the services of 23 experienced field men-who know your local weed, soil and weather conditions. They are available now to advise and show you how to get the most stretch from every dollar in your weed killer budget.

From yards and switches to rights of way and bridges, U.S. Borax can recommend a choice of weed killer spreaders from hand operated PCB Spreaders to power driven equipment to give you the most economical herbicide application possible. This equipment is specifically developed to stretch your weed killer dollar by applying U. S. Borax weed killers most economically in every situation.

630 SHATTO PLACE, LOS ANGELES 5, CALIFORNIA

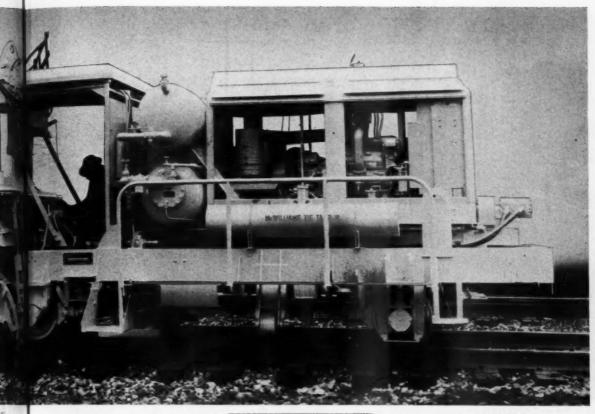
THAT STAYS UP LONGERI

McWILLIAMS TAMPERS

Quilway Maintenance Corporation

BOX THEE





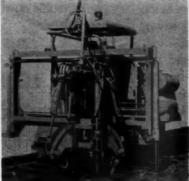
#### NEW McWILLIAMS AIR-HYDRAULIC PRODUCTION TAMPER

now speeds to 1000 feet / hr.

With hydraulic power now performing all operations except air-powered tamping guns . . . this tamper is at least 50% faster than an all-air unit. Provides these important characteristics, too: Automatic Cycling, for more uniform tamping . . . quicker spotting, and far better performance on grades and wet rail . . . smoother, quieter, easier on machine and operator. Now, the lasting qualities of air tamping in a fast, easily-maintained air-hydraulic machine.



McWILLIAMS MULTI-PURPOSE 8—The world's most versatile tamper; in one unit an 8-tool production tamper, a spot tamper, a switch tamper, a jack tamper.



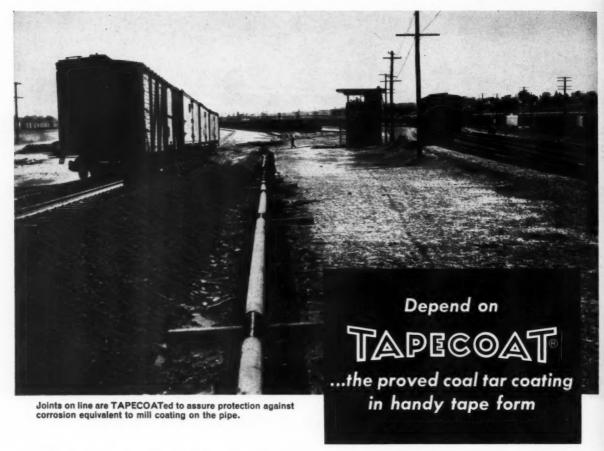
McWILLIAMS SPOT TAMPER—This is the most useful and widest used spot tamper by far. Fast, mobile, with big tamper ballast compaction.



McWILLIAMS COMBINATION—Six maintenance jobs done by one machine; surfaces joints, jacks, tamps, lines, dresses shoulder ballast, brooms ballast.

CTURES

#### How to Protect Pipe in Underground Service



You take no chances when you specify TAPECOAT coal tar coating to protect pipe, pipe joints, fittings, couplings, tanks, tie rods, conduit and cable.

Since 1941, TAPECOAT has proved its superiority in resisting moisture, acids, alkalis, chemical fumes and other severe corrosive and abrasive conditions.

For example, an eastern railroad had a problem with air lines buried in cinders because of frequent failures due to severe corrosive attack. In 1948, this company turned to TAPE-COAT and the lines have remained in perfect condition ever since.

TAPECOAT comes in rolls of 2", 3", 4", 6", 18" and 24" widths. It is

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A TAPECOAT sales and service engineer is always available to help you on your specific corrosion problem. Write for details today.



ORIGINATORS OF COAL TAR COATING IN TAPE FORM

1531 Lyons Street, Evanston, Illinois
Representatives in Principal Cities

Manufactured and distributed in Canada by The Tapecoat Company of Canada, Ltd., 25 Haas Road, Rexdale, Ontario

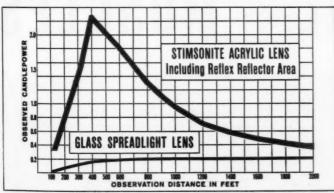
# Stimsonite Switch Lamp Lens

...a new standard of efficiency for long and short range applications

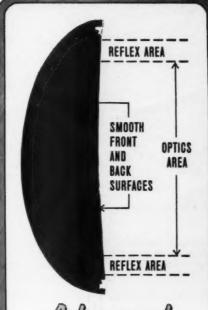
This unique new lens combines the well-known Stimsonite reflecting principle with a new high in optical efficiency obtainable only through precision acrylic molding.

#### THE PROOF IS IN THE PERFORMANCE

The chart below compares candlepower values of a standard glass 30° spreadlight lens and a new Stimsonite lens as seen from a locomotive at distances from 100 to 2,000 feet. Optical efficiency of the Stimsonite lens is 150% that of conventional spreadlight design . . . combined with the bonus output of the reflex area, it produces a light indication 2 to 10 times as bright as glass throughout all operating ranges. Only Stimsonite lenses offer this reflex area for added brightness and standby safety in event of lamp failure.



Comparison of observed candlepower vs. observation distance—red lenses tested in electric switch lamp operated by an Edison Carbonaire battery, Type 2-S-J-1, using a 2.9 volt, .150 ampere inside frosted bulb. Stimsonite curve includes output from optic portion of lens plus reflex reflector area illuminated by dual PAR 56, 200 watt locomotive headlamps.



#### Advanced Design Features

Precision molded optical system features <u>internal</u> elements hermetically sealed against dirt and moisture . . . permanent reflector ring substantially increases brightness and provides standby protection . . . high impact resistance of the acrylic construction means longer life.

Designed to meet A.A.R. Signal Section specifications. Fits oil or electric lamps. Replaces both optical and spreadlight glass lenses.

Sizes available:
5" diam. and 5%" diam.
Colors:

red, green, yellow

For more complete technical information write Thomas A. Edison Industries, Primary Battery Division, Bloomfield, N. J. Ask for Bulletin PB 1092.



THOMAS A. EDISON INDUSTRIES
PRIMARY BATTERY DIVISION
BLOOMFIELD, N. J.



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#### POWER WRENCH

In relaying operations, this fast, powerful tool leads off by quickly backing off the nut of track bolts. Heavy duty, yet light in weight, this machine is easily handled on or off track.



#### SELF-PROPELLED SPIKE PULLER

This two-man, spike puller follows the Mordberg Power Wrench. It exerts an upward pull in excess of 12,000 lbs, through spike tongs, and pulls from 30 to 45 spikes per minute.

# Save time and money on Relaying Rail with NORDBERG MECHANICAL MUSCLES

#### DUN-RITE\* GAGING MACHINE and BRONCO

Follows right behind the adzers. Tie plates are anchored to the ties in exact position, so the head-to-head gage is correct. Speed and extremely accurate gaging are made possible with the Dun-Rite because the plates are gaged before the rail is placed.



#### RAIL DRILL

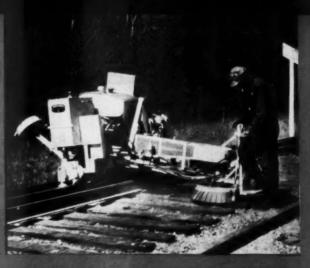
This compact, light weight drill is easily set up and adjusted for fast, accurate work. Self-tightening chuck is simple, and bit is positively held. (In actual operations, Power Wrench would follow Rall Drill, to lighten tract helds.)





#### BALLAST ROUTER

Removes high crib beliast and sweeps tie areas clear so that adzing can be done faster, more accurately, and with greater safety. Adjustable for depth, the Ballast Router cuts a flat trench.



#### SELF-PROPELLED ADZING MACHINE

A dne-man machine with greater power to speed adzing. Self-propulsion provides for force feeding into thes, adding to operator's efficiency. The sests are adzed level and in same plane.

These eight machines, shown in the sequence in which they are used for rail laying operations, are part of the full line of Nordberg "Mechanical Muscles" that have been designed, built and proved in use with the cooperation of track maintenance men.

The nation's leading railroads have proved

that the Nordberg Track Maintenance Machinery shown here will save time and money on rail laying operations . . . and will improve the quality of the finished job. To stretch your maintenance dollars, take full advantage of the savings that are possible by putting Nordberg machines like these to work in your rail gangs.

Write for complete information about any or all of these modern money-saving "Mechanical Muscles".

#### NORDBERG MANUFACTURING COMPANY Milwaukee 1, Wisconsin

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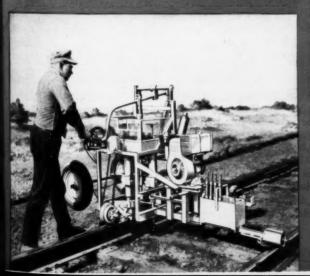
#### TIE DRILL

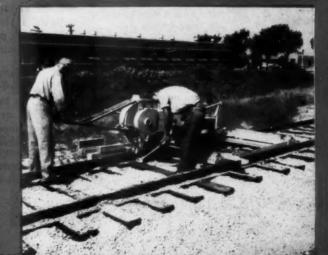
Drills two holes at once for rail holding or plate fastening spikes. This machine operated by one man, can spot and drill 48 holes in the 24 ties of a rail length in just 2½ minutes.



#### SPIKE HAMMER

Finishing up the operation, this machine, with a property organized crew, can drive about 800 spikes per hour, 400 on either side of the rail... driving all spikes straight, vertical to the tie, and to the correct depth.





#### M/W supervisor-Man of the month

Here is our candidate for the man of the month:

- He works long hours, and frequently on Saturdays, Sundays and holidays.
- More often than otherwise, he is dedicated to his job and to the interests of the company he works for.
- His reputation for competence in his highly specialized field is unparalleled in industry.
- While demonstrating loyalty and obedience to directions received from above he must, at the same time, be a leader of men and capable of thinking and acting independently.
- In adjusting himself to an entirely new set of conditions he has demonstrated a degree of adaptability seldom found anywhere.

We are referring to the man who, more than any other single class of employee, is responsible for the safety and integrity of railroad tracks and bridges-the maintenance-of-way and structures supervisor.

Why single out September as the month for extending special recognition to the maintenance supervisor? Simply because this is convention month for the two associations-the Roadmasters' and B&B groups-in which the maintenance supervisor is the central figure.

The question might be raised whether the officers and directors of the two associations exhibit the same qualities in running the affairs of the organizations as they do in discharging their day-to-day responsibilities on the job. To those who are close to the situation in the two groups it is apparent that the answer to this question is definitely in the affirmative. For proof it is necessary merely to point to the fact that membership in both associations is now at an all-time high. This is indeed a remarkable accomplishment, considering that total railroad employment has dropped more than 50 per cent in the past decade.

The success achieved by these two associations during such difficult times is explained partly by the dedication and aggressive leadership exhibited by their officers and directors, and by the loyal support extended by rank-and-file members. However, as important as these factors are it must be recognized that they have been assisted in an important way by another consideration-recognition on the part of railroad management of the vital part played by the supervisor in the railroad picture and of the valuable functions performed by the two associations.

Such recognition has led the managements of most railroads to support the activities of the associations by encouraging eligible employees to join them and to take part in their activities. Another indication of support from higher up has been the fact that many upper-level engineering offcers have joined the associations in recent years, thereby accounting for part of the increase in membership.

The maintenance supervisor has truly earned a place of distinction in the railroad picture for himself and his associations.

#### **Power savings**

Power rates have not risen during the past decade in the same proportion as has labor and materials. But the consumption of electrical energy by railroads has increased during this period with the result that more money is being spent for electric current.

However, a number of railroads have found a way to make substantial savings on these expenditures. Instead of having such bills approved and vouchered on the divisions before being sent to the accounting department for entering, one railroad has the bills sent to an electrical engineer at the road's general office for approval and handling.

This man keeps a running record for each meter and compares the consumption month by month and also annually. From these comparisons he is able to determine which power rate to select that is most beneficial to the railroad. Also, he frequently finds from field trips that it is feasible to make further savings by merging two meters into one.

On another railroad the division forces handle the vouchering but the electrical engineer gets the bills before they are sent to the accounting department so that a running record can be maintained.

The point is that one person should see all the bills and be responsible for maintaining records so that the most desirable rates can be obtained. Railroads using such methods report annual savings in the thousands of dollars. It would be well for those railroads which do not have such a system to look into the possibilities. There's gold in those electrical bills.

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That's right! With General Chemical's powerful UROX Weed Killer you can actually stop weeds on your system for a longer time and at lower cost than you ever thought possible, here's why:

UROX is so effective just one application wipes out

weeds and brush for as long as 8-18 months! Results carry over, too! Because the effects of UROX are cumulative, herbicidal action can be continued year after year with small "booster" treatments. UROX is available in both liquid and granular forms.



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RUCTURES

Clear the tracks! There's nothing that's going to interfere with top maintenance efficiency on this road. One treatment of UROX kept this road bed in top condition all season long.



This siding switch was covered with weeds until UROX was used to clean up the problem. Heavy vegetation problem is shown along side of the treated strip.



What happened here? You guessed it. UROX was used only in foreground for demonstration purposes. Dense Florida growth chokes the untreated background.



UROX is excellent along track installations like this perfectly maintained New Jersey tankcar loading depot.





Before applications of UROX were used, maintenance men could not hold down weeds here successfully. After one UROX treatment weed control is underway.

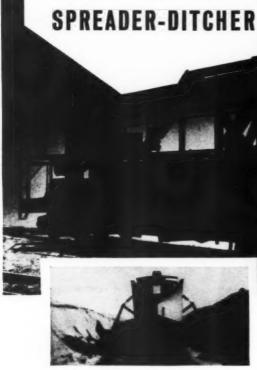
For more information on UROX and URAB, write, Weed & Brush Killer Dept. General Chemical Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N.Y.

For brush control along right-of-ways, in yards, etc., Allied Chemical's URAB® kills toughest deep-rooted brush, briars, even weed trees... gives up to 100% control with a single application.

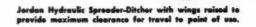


GENERAL CHEMICAL DIVISION 40 Rector Street, New York 6, N. Y.

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COSTS LESS-The Jordan Hydraulic Spreader-Ditcher costs less than other equipment designed for the same purpose because it accomplishes more in a given period of time. Sturdy construction assures continuous, uninterrupted work output. Wide versatility makes possible substantial savings in time and man-power in all types of maintenance operations the year 'round.

Write or call today for free brochure describing the many unique, exclusive features of the Jordan Hydraulic Spreader-Ditcher. We also will be pleased to arrange for a demonstration at your convenience.



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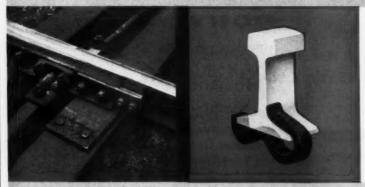
Here is today's most effective and lowest cost method of reducing track wear. The rugged M&S Rail Lubricator can be installed quickly and simply without shims of any kind and is held in position with clip bolts. Four applicators 26" apart distribute grease evenly and continuously along the rail—

no wiping bars or special rail needed, no valves or drilling of rail required. The heat-treated, high carbon-high chrome tool

The heat-treated, high carbon-high chrome tool steel blades are easily removed in track for cleaning and can be replaced inexpensively. All moving parts are self-lubricated . . . gear pump and ratchet

drive are always submerged in grease . . . plunger block contains its own reservoir of oil which lubricates working parts.

Drive shaft and feed hoses are low to prevent stumbling by track men; long proven thoroughly reliable type drive shaft.



#### M&S RAIL ANCHOR

Made in one piece from heat-treated high carbon spring steel bars, the M&S Rail Anchor grips the rail uniformly over large surfaces. Large spring take-up provides adequate grip on rails that are reasonably worn or that are on low side of the rolling tolerance. Can be applied by machine or hand and when installed with maul or spike maul, the M&S Rail Anchor can never be over-driven; can be applied and reapplied indefinitely without loss of efficiency; striking angle is at 45° so that a glancing blow cannot hit the rail web. Due to large bearing area on top of rail base, possibility of damage by derailed wheels is reduced to an absolute minimum. Simple to install, the rugged M&S Rail Anchor provides large bend radii where high tensile stresses are encountered. In addition, it does not extend too far into ballast—only 1% below base of rail.

#### A M&S SWITCH POINT PROTECTOR

The rugged Switch Point Protector is quickly installed by means of simple clip bolts—no holes to drill because existing holes in switch point and reinforcing bar are utilized. Replaceable protector blades, made of alloy steel and heat treated to give

maximum wear hardness, actually cost less than welding up switch points and are quick and easy to install. The economical Protector can even be used on mainline track since it is fastened to the switch point and clears wheel flanges when point

is open. There is no load against opposite point; that is, it does not throw opposite wheel flange against opposite point. The M&S Switch Point Protector fits right or left hand switches; available for Interlocking or Power Switches.

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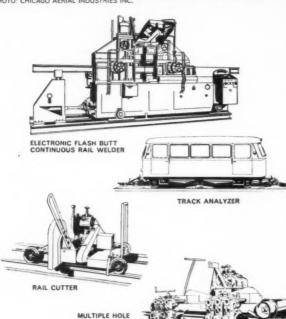
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September, 1961

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RAILWAY TRACK and STRUCTURES

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It's a fact. Gulf's four-point program can help you shrink maintenance costs. Here's what it includes: (1) the use of high quality lubricants and fuels throughout your system to keep equipment operating smoothly and continuously, (2) expert petroleum engineering counsel to help you select the types and grades of lubricants and fuels best suited to your equipment and operating conditions, (3) simplified lubrication to avoid unnecessary ordering, handling and storage of lubes, and (4) prompt delivery service when and where you need it.

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#### STRUCTURES NEWS NOTES

#### . a résumé of current events throughout the railroad world

Estimated net income of Class I railroads in June 1961 was the same (\$43 million) as in June 1960, but was well below the \$73 million reported for June 1959, according to figures compiled by the Bureau of Railway Economics of the AAR. Even so, June was a definite improvement over the first half as a whole. Net income for the first six months of 1961 was estimated at \$60 million, far below the \$238 million reported for the corresponding period of 1960 and the \$307 million earned in the first half of 1959.

Merger activity continues at a high level. An open secret for many months, L&N-C&El merger studies became an announced fact after the Missouri Pacific recently announced it had purchased a substantial block of C&EI securities "to protect its interest." Meanwhile, ICC hearings are scheduled to start September 27 on the application of the Norfolk & Western to merge with the Nickel Plate, lease the Wabash preparatory to eventual merger with that carrier, and buy up the Pennsylvania's 111-mile line between Sandusky, Ohio, and Columbus. On the same date hearings on the battle of the Santa Fe and the Southern Pacific to win control of the Western Pacific will be reconvened at San Francisco, and on September 29, hearings will get underway on the merger application of the GN-NP-CB&Q.

> A bill has been introduced in the Senate by Senator Clair Engle (Dem., Calif.) which would authorize a \$500 million program of federal loans to state, county and local transit authorities for development of new mass transportation systems. Possible motive behind the bill is the need for capital to finance a \$192 million project to rebuild a network of rapid transit lines that formerly served Los Angeles. Initiation of the program comes only a few months after disappearance of the last remnants of the once-great Pacific Electric commuter system. PE couldn't compete with the freeways; now the city wants its railroads back.

The so-called "Hoffa bill," which contains provisions designed to emasculate the 1958 Transportation Act's rate-freedom provisions, is not expected to be passed this year. Hearings before the Senate Commerce Committee on the bill recently were terminated, with the prospect that the proposed legislation would not get committee clearance this year. But the bill is expected to remain alive and to come up for reconsideration in 1962—an election year.

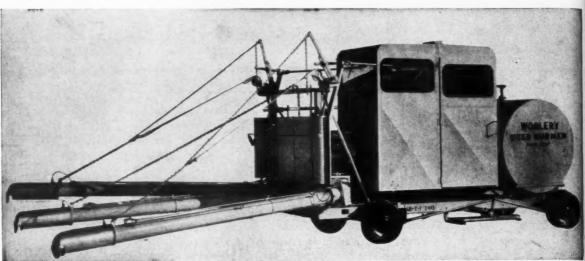
> A crackdown on illegal trucking is the objective of the newly organized Committee Against Unauthorized Transportation. The committee, known as CAUT, represents a combined effort of the railroads, legitimate truckers, shippers, forwarders and regulators. Its purpose is a three-point program to educate shippers and other interested groups about the adverse effects of unauthorized transportation, to encourage stricter and more effective enforcement of existing laws governing unauthorized transportation, and to analyze additional steps to promote enforcement and to combat in other ways unauthorized transport operations.

In a letter to Secretary of Commerce Luther A. Hodges, President Kennedy has asked for a report on the transportation situation. The President set November 1 as a date for "recommendations which could be made at the next session of Congress." Although the President's letter did not specifically mention the railroads, sources at the White House and in the Commerce Department feel the study will be heavily oriented to rail problems.

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## WOOLERY FOR LOW COST TRACK MAINTENANCE





#### WEED BURNERS

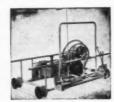
The model WB-2-F (above) has automatic transmission with torque converter; constant blower speed regardless of rate of travel; an all steel cab with safety glass, two entirely separate brake systems and a final drive with chains and sprockets located outside the wheels for easy adjustment. A separate 15-H.P. air-cooled engine is used to drive the blower. Thus when speed is reduced—such as is necessary in yard or snow melting work— the blower speed maintains the same rate and heat intensity.

The model COE (above) makes use of a torque converter on the propelling engine which gives any speed desired for burning or deadheading. It burns to a width of 25 feet using all five burners. If desired, a second trip can be made with the two outer arms extended to an additional width of five feet on each side. Burners are under separate and instantaneous control of the operator. The two outer arms can be raised or lowered or can swing in or out to coincide with the contour of the ground. Other Woolery Burners inculde the Model PB-B, 3 burner portable and the AB single burner portable (shown at right).

#### TIE CUTTERS - TIE-END REMOVERS

The Woolery Tie Cutter is a sturdy, light-weight machine that replaces ties with a minimum amount of disturbance to line or surface of the track. A reciprocating saw blade cuts the ties just inside the tie plate on both sides. The center piece is pried out and the Woolery Tie End Remover pushes the ends out thru use of a double-acting, double-ended hydraulic cylinder.





A simple turn of the valve handle causes the two tie ends to be pushed com-pletely clear of the rail.



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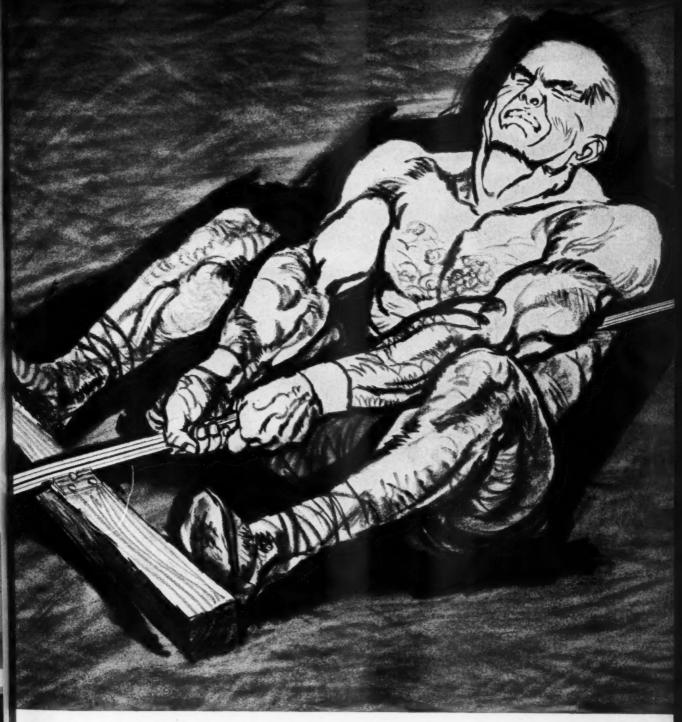


SPIKE DRIVERS



The Woolery Spike Driver is designed marily for use by tie renewal gangs. ious other pneumatic tools can also operated with it. Rubber-tired se

RAILWAY TRACK and STRUCTURE



### Ballast will yield before Woodings Rail Anchor will budge WOODINGS ADVANCED TYPE RAIL ANCHOR

The powerful spring compression, the tenacious 4-point symmetrical grip and the deep bearing surface make Woodings the world's most powerful rail anchor—the BEST for welded rail, BEST for machine applications, BEST for reapplication.



Deep bearing surface assures firm contact with all types of ties, straight, curved or beveled.





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- **3. TEXACO 904 GREASE** prevents rail joint corrosion, kinks and pull-intwos. This rail joint protection can last as long as ten years. There's no costly disruption of traffic flow during application, because rail joints don't have to be taken down. You pump in Texaco 904 Grease. Protected with seals of Texaco 1407 Plastic Material H against moisture, brine and cinders, 904 Grease works into bolts for maximum protection against wear and rusting. Bolt-replacement costs go down.
- **4. TEXACO 904 GREASE** for curved rail lubrication increases rail life, cuts curve resistance, increases wheel life, permits higher tonnage ratings. Works perfectly in all grease-type rail lubricators.
- **5. TEXACO TEXTICOTE** waterproofs wood ties at minimum cost, prevents cracking and splitting. Texticote won't check, chip or become brittle, so it stays on despite vibration and shock, especially when coated with gravel or crushed stone.
- **6. TEXACO LIQUID BRIDGE CEMENT** protects bridge ties up to eight years against fusees, brake-shoe sparks, coals, severe weather. Tests and actual use show that Texaco Liquid Bridge Cement can last eight years or more, and costs only pennies per tie. Can be sprayed or applied with mops or brushes. This low-cost coating makes ties, stringers and decking waterproof, prevents the cracking and splitting that opens them up to frost damage.

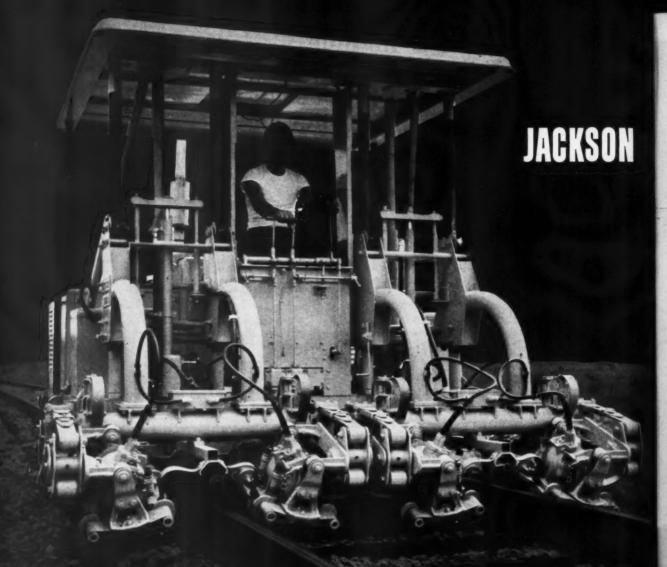
If you want more information on any of these products, or if you're having a maintenance-of-way problem, consult a Texaco Lubrication Engineer. Call the nearest Texaco Railway Sales Office in New York, Chicago, San Francisco, St. Paul, St. Louis or Atlanta. Or, write Texaco Inc., Railway Sales Division, 135 East 42nd Street, New York 17, N.Y.

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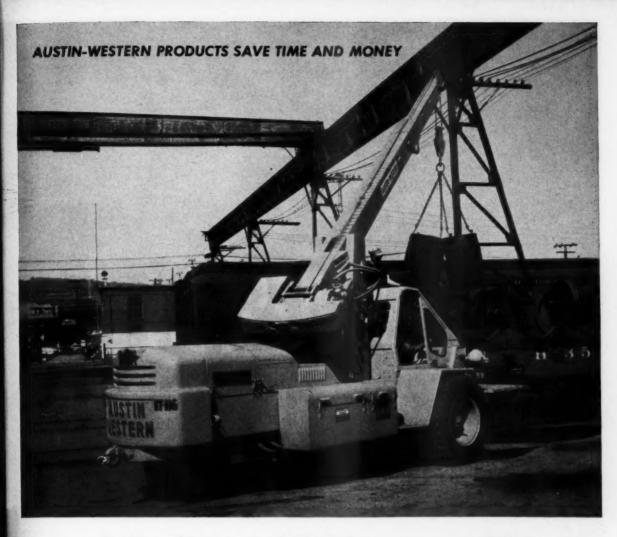


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Other time and money saving features include dual front driving wheels; road speeds from 2 to 18 mph. Torque converter and full hydraulic reversing mechanism are standard. The 110 can be adapted to your particular job needs with various combinations of features and equipment. And it's designed and built for easy, economical, troublefree maintenance.

Why not take a good look at this versatile new piece of materials handling equipment. Ask your Austin-Western distributor for a demonstration or write us for details.

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Double flange for wide striking surface. Channeloc is easy to apply with sledge, maul or machine - no skewing.



Channeloc is 100% tie-bearing with generous contact surface. Won't disturb tie plates, because it doesn't touch them. ness of bar stock.



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Rugged double-flange support gives you greatest gripping power, from end to end. One powerful reason why Channeloc has become the fastest growing anchor in the business. Five other reasons are shown at left. True Temper will be glad to help you see that anchors are properly applied. Contact True Temper, Railway Appliance Division, 1623 Euclid Avenue, Cleveland 15, Ohio.

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Precision of lift and uniformity of compaction controlled automatically.

All variations in lift, level and run-out controlled from operator's panel.

Beam "sighting" for utmost precision.

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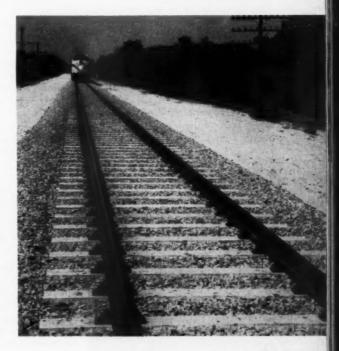
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# **Progress report**

# Status of the concrete tie today

A number of types of concrete ties are now available here, and test installations of several of them have been under observation for some time. This report describes the types available, lists the test installations, gives data on their performance to date, and takes a look at the future.



• It has now been more than 18 months since the first test installations of prestressed concrete ties were made in the United States.

The present would, therefore, seem to be an appropriate time to evaluate the progress made by the concrete tie since those installations were made. In other words, how have the original installations per-

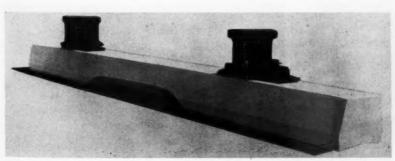
formed in service, what further installations have been made or are planned, and what additional types of concrete ties are now available?

Answering the last question first, readers are referred to the material at the bottom of this and the following two pages. Here are pictured and described the various types of concrete ties that are known to have

been installed or are available for use in this country and Canada. So far as is known no railroads in North America are installing concrete ties as a regular practice. However, a number of test installations have been made and these are listed in the table on page 39. Some of these installations, it will be noted, have been under observation

# Types of concrete ties





MR-1; MR-2—Designed by the AAR research staff, the MR-1 concrete tie (above) came into being in 1959, and its manufacture was undertaken by the American Concrete Cross-tie Corporation, Tampa, Fla. The tie is 8 ft 6 in long, and in cross section it is 7 in deep, 12 in wide at the bottom and 9 in wide at the top. To prevent center-binding a 3-ft section at the

middle is wedge-shaped on the bottom. Prestressing was provided by four 7/16-in strands tensioned with a total force of 82,000 lb. Accessories included steel tie plates, pads and bolted clips.

The MR-2 differs from the MR-1 in several respects. The two top prestressing strands were raised ½ in to get increased compression in the top of the tie, and the



wedge-shaped area was modified. To make it possible to use the tie without a steel tie plate, called "direct fixation," the MR-2 can be cast with "daps" on a 1:40 cant and a special clip, called the "Uniclip" (above), was designed which has a flange that fits against the edge of the dap. With direct fixation a laminated hardwood pad is used between rail and tie.

# Status of the concrete tie today cont'd

since early last year. Hence, the owning railroads are now in a position to render at least a preliminary opinion regarding the performance of the ties in service.

One of these roads is the Seaboard Air Line. Speaking of this road's original installation of 600 MR-1 ties near Tampa, Fla., T. B. Hutcheson, chief engineer of the SAL, advises that some 200 of these ties were spot-tamped in April 1960, a month after the installation was

made. "Since that date," he adds, "we have performed no smoothing or lining, and I consider their performance to date in respect to holding surface and alinement to have been very good."

Mr. Hutcheson, however, goes on to point out that "there were some failures in the original 600 ties, which showed up as cracks through the bolt holes." "Such failures," he explains, "were attributed generally to the rush in getting these ties manufactured, which resulted in some bond slippage of the prestressing strands near the ends of the ties. We have replaced 25 ties in this test section to date."



Among the several roads making installations of concrete ties early in 1960 was the Western Pacific. The WP installation of 50 Gerwick-type prestressed concrete ties is divided between the two approach tracks of a transfer bridge at the road's 25th Street yard in San Francisco.

"Recent inspection of this test installation," says F. R. Woolford, chief engineer of the WP, "revealed that the ties are functioning satisfactorily. No work has been done on the track since installation and it does not appear that any surfacing work will be necessary, although a few bolts may need tightening in the next year or two.

"It is the WP's experience to date," says Mr. Woolford, "that prestressed concrete ties of a design similar to the Gerwick design are most satisfactory for yard use. There does not appear to be any difference between the 28-in and 30-in spacing from the standpoint of serviceability. The ties should be installed out-of-face and not patched in, which will produce a most satisfactory yard maintenance condition. The cost of the prestressed concrete tie in comparison to the wood tie is the only drawback as to justification."

At least two railroads have followed up their original installations with additional tests. The Atlantic Coast Line is one of these. This road. it will be noted from the tabulation, installed 500 MR-1 concrete ties in its main line at Four Oaks, N. C., early last year. In July 1961 an additional 500 concrete ties were installed in the northward track at the same location commencing at the south end of the previous installation. In other words the road now has a continuous test section of 1000 ties measuring 2500 ft in length. The rail in this territory is of the 132-lb RE section and is welded.

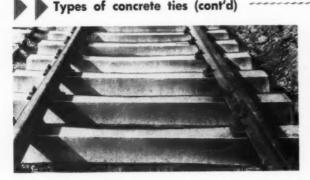
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This new installation of concrete ties at Four Oaks consists of MR-2-type ties. No steel tie plates are used. The rails are placed directly on 7-in by 9½-in by ½-in treated hardwood pads. In other words the assembly is of the direct-fixation type. The rails are fastened to the ties by Uniclips.

Commenting on the experience to



TEST INSTALLATION of concrete ties on the Western Pacific is located on yard tracks carrying heavy traffic.



Gerwick type—This concrete tie was designed by Ben C. Gerwick, Inc., San Francisco, in conjunction with the Western Pacific. It is 8 ft long and 8 in deep at the ends. At the center the width is 6 in wide at the top and 85% in at the bottom. From these dimensions it flares to a width at the ends of 9 in at the top and 12 in at the bottom. Top surface is canted 1:40 toward the center. A bolt-and-clip fastening is used, with three different types of anchorage in the tie. Prestressing is by eight %-in strands tensioned to give a total force of 89,600 lb.



RS (Roger Sonneville) type—This mixed-type concrete tie originated in France. It is available in the United States from Sperry Products Company, Danbury, Conn., and in Canada from Wm. C. Duncan Limited, Downsview, Ont. The tie is composed of two reinforced concrete blocks connected by a Y-shaped steel tie bar which also forms the main reinforcement of the blocks. Base dimensions of blocks are 11½ in by 20 in. A thin grooved rubber pad is placed between the rail and tie. The rail is fastened to the tie by double elastic spring clips.

# Installations of Concrete Crossties in United States and Canada

Company	Location	Type of Tie	Number	Spacing (Inches)	When installed	Romarks
ACL	Four Oaks, N. C.	MR-1	500	30	FebApril 1960	132-lb welded rail
ACL	Four Oaks, N. C.	MR-2	500	30	July 1961	132-lb welded rail-no steel tie plates
CNR	Drummondville,	472.4	000	00	, and 1001	
CAR	Que.	MR-2	800	30	Oct. 1961	132-lb welded rail
CNR	Drummondville,					
	Que.	RS	1000	-	Oct. 1961	132-lb welded rail
CRRNJ .	Ashley, Pa.	RS	10	21	1961	Jointed track
DM&IR	Saginaw, Mich.	MR-1	100	26	Oct. 1960	Under closure rail between strings
Edwards Air Force Base	Southern California	Gerwick	95	_		
General Portland Cement Co.	Lake Charles, La.	MR-2	450	30	June 1961	Industrial track-90 lb rail
Ideal Cement Co.	Tampa, Fla.	MR-2	250	32	June 1961	Industrial track—includes 20-deg curve—100-lb rail-no tie plates
L&N	Montgomery, Ala.	_	6	22	Oct. 1958	Jointed track
ONS&L	_	MR-2	450	_	1961	132-lb welded rail
StL-SF	Pensacola, Fla.	MR-1	22			At washing platform
SAL	Tampa, Fla.	MR-1	600	30	March 1960	Welded rail
		MR-2	153	30	June-July 1961	123 are on ballast-deck concrete
SAL	McClenny, Fla.	MR-2	153	30	June-July 1901	trestle, 15 on approach at each end
U.S. Steel Corp.	Wyoming	Gerwick	577	-		On new 76-mile line to ore deposits
WP	San Francisco	Gerwick	50	26-28-30	March 1960	Installed in heavy traffic yard tracks

date with the MR-2 ties, L. E. Bates, chief engineer of the ACL, stated that "as far as I know we have not experienced any difficulty with the ties, but we have had trouble with some of the clips breaking, which have been replaced by the manufacturer."

### New SAL test

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The Seaboard, too, has made an additional installation of concrete ties, which are also of the MR-2 type. On June 26 and 27, 1961, the railroad installed 123 such ties on a 309-ft ballast-deck concrete trestle. The

bridge, consisting of prestressed piles, poured-in-place caps and precast reinforced deck slabs, was built recently to replace a timber trestle. The concrete ties placed on the bridge, explains Mr. Hutcheson, have from 4 in to 41/2 in of ballast between the bottoms of the ties and the top of the deck. On July 3 an additional 30 ties were placed on the fill approaches, 15 at each end. This installation was made, according to Mr. Hutcheson, because he "felt we needed to have experience with these ties on a rigid structure of this type."

Soon after this installation was

made small cracks started developing near the center line of track in the top of most of those ties on the bridge, whereas the ties on the approach embankments remained in good condition. An investigation of the cause of these cracks was made by G. M. Magee, director of engineering research, AAR, and E. J. Ruble, research engineer structures. The fact that the cracks appeared only in those ties on the bridge "indicated that the rigidity of the bridge was the primary cause of the center cracking of the tie," explained Mr. Magee in reporting on the results of the investigation. He added:

"A detailed inspection of the installation indicated only about 4 in of ballast between the bottom of the tie and the rigid prestressed concrete slabs. The ties were observed under the passage of a long freight train and it was evident that those on the bridge were about rigid with only slight vertical movement, while those on the embankments were moving up and down under each wheel load in the usual manner.

"In normal track, where the ties are resting on about 12 in of ballast, which is supported by a gravel or dirt subgrade, the track is elastic which results in the axle loads being carried by several ties, with the tie under the axle carrying only about 50 per cent of the load when spaced at 30-in centers. In a rigid track, each tie will carry about 100 per

(Continued on page 80)



B-58 German type—This prestressed concrete tie is standard for use on the German Federal Railways. It is about 8 ft long and is 8 in deep at the ends, with the top surface canted toward the center. Top width is 6 in throughout, but the bottom width flares out from about 8 in at the center to approximately 12 in at the ends. Steel tie plates are used, and fastenings

consist of clips held by spikes sunk in wood dowells embedded in the concrete. The B-58 tie is available in this country in two alternative forms. One is the so-called Karig-Dywidag tie which is offered here by U. S. Crosstie, Inc., Milwaukee, Wis. This is a post-tensioned tie with the tensioning provided by four steel

strands. The other alternative form of the B-58 is the so-called Thosti tie with "BBRV" prestressing. This tie is available in the U. S. from the Railroad Research Corporation, Encino, Calif. The reinforcement consists of 8 wires anchored at each end by two anchor heads and by BBRV upset heads. The B-58 was developed following experience with earlier designs.

# Roadmasters', B&B groups map attack



E. F. Snyder
President
Roadmasters' Association



H. D. Curie
President
B&B Association

# Watch for these special features

Transportation Policies and Their Effects on Maintenance of Way Programs—Address by C. E. Bertrand, joint session, Monday am.

Progress Under Changing Conditions—Address by T. B. Hutcheson, joint session, Monday am.

Ring Compression Theory of Culvert Design— Address by H. L. White, B&B session, Monday pm.

Stand Up and Be Counted—Address by Wayne Johnston, joint session, Tuesday am.

Where to Now in Maintenance of Way and Structures—Address by J. P. Hiltz, Jr., joint session, Tuesday am.

The Better Way for the Santa Fe—Color moving picture showing construction of 44-mile line change in Arizona, joint session, Tuesday am.

Annual Banquet—6:30 pm, Tuesday, Grand Ballroom.

Epoxies and Their Uses in Railroad B&B Work— Panel discussion, B&B session, Wednesday am.

# Here are programs of sessions to

# Joint activities

Monday morning, September 18 (Williford room)

10:00 am—Invocation by Dr. Kenneth Hildebrand, pastor,
Central Church
Welcome by presidents of Roadmasters' and
Bridge & Building Associations
Greetings from R. H. Beeder, president, American Railway Engineering Association
Greetings from R. T. Johnson, Jr., president,
Association of Track and Structure Suppliers
Remarks by P. J. Wolf, first vice president,
AT&SS

10:30 am—Address on Transportation Policies and Their Effects on Maintenance of Way Programs by C. E. Bertrand, vice president (operation and maintenance), Baltimore & Ohio, Baltimore, Md.

11:10 am—Address on Progress Under Changing Conditions by T. B. Hutcheson, chief engineer, Seaboard Air Line, Richmond, Va.

11:50 am-Announcements 12:00 noon-Adjourn

# Tuesday morning

9:30 am-Address on Stand Up and Be Counted by Wayne Johnston, president, Illinois Central, Chi-

10:30 am—Address on Where to Now in Maintenance of Way and Structures by J. P. Hiltz, Jr., vice president (operations & maintenance), Delaware & Hudson, Albany, N. Y.

11:15 am-Color moving picture on construction of Santa Fe's 44-mile line change in Arizona

11:50 am—Announcements 12:00 noon—Adjourn

### Tuesday evening (Grand Ballroom—Informal)

6:30 pm—Annual banquet of Roadmasters' and B&B Associations—sponsored by the Association of Track and Structure Suppliers. Tickets are issued only to paid-up members of the two associations and members of their families entitled to railroad pass privileges.



By R. T. Johnson, Jr.

President
Association of Track
and Structure Suppliers

# An invitation-and a word about next year's exhibit

This year again it is the privilege of the Association of Track & Structure Suppliers to sponsor a banquet for the Roadmasters' and Bridge & Building Associations. On behalf of the member companies of the AT&SS I hereby extend to the members of these associations and their families a cordial invitation to attend the banquet which will be held in the Conrad Hilton's Grand Ballroom on the evening of September 19. You will find that the Entertainment committee of our association has arranged a fine program for your enjoyment.

I also want to tell you about our

plans for the exhibit that is scheduled to be held in conjunction with your conventions next year. I am happy to report that arrangements have been made to hold the exhibit at McCormick Place, the huge new exposition center on Chicago's lakefront. It is the hope of our association that the business sessions of your annual meetings next year will be held under the same roof as the exhibition, and our association is prepared to provide meeting rooms for this purpose at the exposition center. This arrangement, we are convinced, will promote your convenience and assure the success of your meetings.

# on top problems at annual meetings

# be held at the Conrad Hilton Hotel, Chicago, September 18-19-20

## Roadmasters' sessions

(Williford room)

### Monday afternoon

2:00 pm-Address by President E. F. Snyder

2:25 pm—Recognition of past presidents by S. E. Tracy 2:35 pm—Report of Standing Committee No. 1—Machinery for Maintenance of Way Work, L. G. Law-son, chairman (rdm., CNR, Melville, Sask.,

Can.) 3:00 pm-Report of Special Committee No. 4-Handling,

Housing and Economics of Track Gangs, E. W. Smith, chairman (asst. to ch. engr., Frisco, Springfield, Mo.)

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3:30 pm-Report of Special Committee No. 6-Inspection, Renewal of Ties in Track and Disposal of Re-leased Ties, W. H. Shideler, chairman, (asst. div. engr., MP, Monroe, La.)

# Tuesday afternoon

2:00 pm-Report of Special Committee No. 2-The Effect of Mechanization on Maintenance Forces and

on Track Maintenance, R. K. Shortt, chairman (asst. div. engr., C&O, Richmond, Va.)

2:30 pm—Report of Special Committee No. 1—Latest Methods and Machines for Improving and Reducing Maintenance of Track, C. T. Popma, the chairman (dist. engr., NYC, Syracuse, N. Y.) 2:55 pm—Report of Special Committee No. 3—Maintain-

ing Continuous Rail in Track, J. R. Talbott, Jr., chairman (supv. trk., RF&P, Richmond, Va.) 3:10 pm—Report of Standing Committee No. 3—Roadway,

C. P. Martini, chairman, (rdm., Soo Line, Stevens Point, Wis.)

### Wednesday morning

9:30 am-Report of Special Committee No. 5-Handling Territories Subject to Washouts & Storm Damage, D. B. Armstrong, chairman (asst. engr., GC&SF, Galveston, Tex.)

10:00 am-Report of Standing Committee No. 2-Track, R. R. Gunderson, chairman (eng. M. W., WM, Baltimore, Md.)

10:30 am-Business session

Election and installation of officers by E. L. Anderson, retired chief engineer, Frisco

# **Bridge & Building sessions**

(Beverly room)

### Monday afternoon

2:00 pm—Address by President H. D. Curie 2:20 pm—Recognition of past presidents 2:30 pm—Report of Committee No. 1—Protection and Preservation of Bridge Decks and Timber Tres-

Preservation of Bridge Decks and Timber Trestles, C. F. Parvin, chairman (engr. M.W.&S., PRR, Philadelphia, Pa.)

3:00 pm—Report of Committee No. 2—Inventory Reduction by Local Purchase and Delivery to Job Site by Local Supplier, H. D. Hellweg, chairman (asst. reg. engr., GM&O, Bloomington, Ind.)

3:45 pm—Illustrated address on Ring Compression Theory of Culvert Design by H. L. White, ch. sales

engr., Armco Drainage & Metal Products, Inc., Middleton, Ohio

# Tuesday afternoon

2:00 pm-Report of Committee No. 3-Simplifying Accounting Methods and Work Reports, J. A. Caywood, chairman (asst. ch. engr.-maint., B&O,

Baltimore, Md.)

2:35 pm—Report of Committee No. 5—Selection, Application and Cost of Roofing Materials, W. W. Caines, chairman (supv. b.&b., C&O, Huntington, W. Va.)

3:15 pm-Report of Committee No. 4-Modern Tools and Equipment for B&B Gangs, R. A. Youngblood, chairman (pro. supt., b.&b., C of Ga., Savannah, Ga.)-To include showing of color moving pic-

# Wednesday morning

9:30 am-Business Session

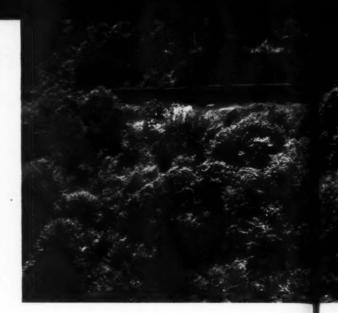
9:50 am-Panel discussion-Epoxies and Their Uses in Railroad B&B Work Moderator-J. R. Williams, asst. engr. br., Rock Island, Chicago What are epoxies?-R. C. Alexander, tech. repr., Jones-Dabney Co., Chicago Applications in the railroad field—J. R. Williams Epoxies and research—Freeman Drew, asst. res. engr. struct., AAR, Chicago 10:50 am—Election and installation of officers

# Directory of AREA committee meetings scheduled for convention week

		the AREA, including scheduled meetings					
during the Roadma	nd B&B conventions.			9-20	9:00 am to 5:00 pm	Upper Tower	
Committee	Date	Time	Room	Economics of Ry.	9-19	9:00 am to Noon	PDR 3
Roadway & Ballast	9-17	9:30 am to 5:00 pm	PDR 1	Location & Oper.	9-19	Noon (luncheon)	PDR 3
	9-18	9:00 am to Noon	PDR 1	Subcommittee 1	9-18	1:00 pm to 5:00 pm	Par. 24
Ties & Wood				Subcommittee 2	9-18	1:00 pm to 5:00 pm	Par. 26
Preservation	9-20	1:00 pm to 5:00 pm	PDR 18	Electricity	9-19	1:00 pm to 5:00 pm	Par. 27
Rail	9-19	9:30 am to 2:30 pm	Lower	Contract Forms	9-19	9:30 am to 5:00 pm	Par. 28
			Tower		9-20	9:30 am to 5:00 pm	Par. 28
Track	9-19	9:30 am to 5:00 pm	PDR 1	Economics of Ry. Labor	9-19	9:30 am to 5:00 pm	Training
Buildings	9-18	9:00 am to 5:00 pm	PDR 3				14 Floor
Masonry	9-19	9:30 am to 5:00 pm	PDR 4	Maintenance of Way	9-18	9:00 am to 5:00 pm	PDR 4
	9-20	9:30 am to 5:00 pm	PDR 4	Work Equipment	9-19	9:00 am to 5:00 pm	PDR 18
Highways	9-19	9:00 am to 5:00 pm	Par. 26	Clearances	9-19	10:00 am to 5:00 pm	Par. 24
Engineering				Special Committee on			
& Valuation Record	s 9-20	9:00 am to 5:00 pm	PDR 3	Welded Rail	9-19	2:00 pm to 5:00 pm	PDR 2
Yards & Terminals	9-19	9:00 am to 5:00 pm	Upper	Nominating			
			Tower	Committee	9-18	3:00 pm to 5:00 pm	PDR 18

THE B&O COAL TRAIN in this view is moving east on heat-treated 140-lb RE rail laid in March 1960. The grade here is 2.8 per cent ascending eastbound, and the curvature is 9 deg 45 min.

Where the Baltimore & Ohio's main line crosses the summit of the Appalachians the grades, curvature and traffic combine to produce excessive rail wear on curves. As a result the average rail life in one section is only twelve months. By using heat-treated rail the road expects to triple or quadruple the service life. And by installing rail lubricators it is expected that the life of the heat-treated rail will be extended to eight times that of untreated rail.



# Heat-treated rail licks acute

• If a competition were to be held to locate the track that provides the worst rail-wear conditions in the country, Baltimore & Ohio engineers would have a candidate to offer.

It would be the 47-mile stretch of track between Piedmont, W. Va., and Rowlesburg, where the road's Baltimore-St. Louis main line crosses the summit of the Appalachian range. More specifically, it would be the eastbound freight track of this two and three-track railroad. For there is one segment of this stretch where the average service life of rail on curves is no more than one year. The damage is done by high wheel loads, heavy traffic, steep grades and sharp curvature.

### Finds answer to problem

The railroad is now convinced it has found the answer to this railwear problem. About a year and a half ago it began replacing the worn-out rail on these curves with rails that had been fully heat-treated. Based on observation of the heat-treated rail in service B&O officers estimate it will give three to four times the service life in this territory of untreated steel. And by installing curve lubricators they figure the service life of the heattreated rail will be increased to about eight times that of conventional rail.

The curves, grades and traffic conditions in the territory between Piedmont and Rowlesburg are tailor-made for rapid rail wear. On the east slope is the so-called "Seventeen-mile" grade where the line rises continuously toward the summit on grades ranging up to 2.57 per cent. Curves on this grade occur in rapid succession and range in sharpness up to 10 deg 15 min.

### Coal trains cause wear

On the west slope the line negotiates a grade 12.3 miles long, known as "Cranberry grade," which reaches a maximum of 2.89 per cent. The sharpest curvature here is 9 deg 45 min. At the summit of the mountain the two grades are connected by a relatively flat section of line, 18.5 miles long, known as "The glades."

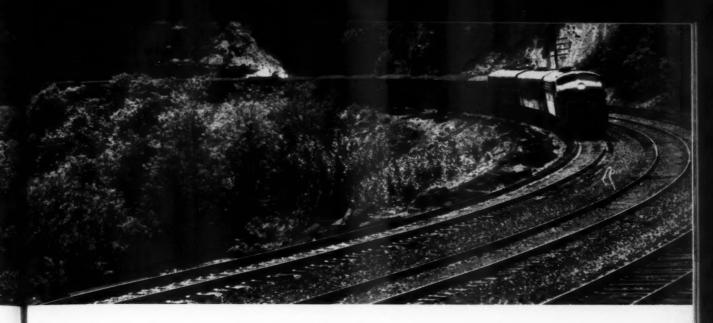
The traffic handled over the eastbound tonnage track of this line amounts to 40.7 million gross tons annually. The great preponderance of this is coal which moves eastbound in solid trains of 100 cars. In moving these trains up the Cranberry grade the five diesel units at the head end of the train are normally assisted by a helper engine consisting of six diesel units.

It is the coal trains operating around the sharp curves that are the primary cause of the rapid rail wear, which is found entirely in the eastbound tonnage track. On the Cranberry, or uphill, grade of this track the effect of the slow-moving heavy-tonnage trains is to cause a condition of severe plastic deformation, or crushing, to develop in the low rails on curves. They also cause the head of the high rail to be worn down rapidly.

However, the most severe railwear conditions are encountered on Seventeen-mile grade on the other side of the summit. Here the punishment inflicted by the faster-moving coal trains on the downgrade takes the form of excessive flange wear of the high rails on curves. It is because of this wear that the average service life of rails on curves in this section is about twelve months.

### Costly in materials and labor

To get the greatest possible service life out of the rail the practice has been to transpose the rails on curves when the wear of the high rail had reached a specified amount. It is thus apparent that the rapid rail wear was a source of expense to the railroad not only because of the loss of material but also because of the labor expense involved in replacing and transposing the rail. "This kind of work was using up 25 per cent of the time of our available track force in the area," says J. A. Caywood, the Baltimore & Ohio's assist-



# wear problem in mountain territory

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For a number of years the Bethlehem Steel Company had been offering fully heat-treated rail for use at locations where the rail is subject to unusually severe wear. This rail is available at an extra cost of \$65.00 per ton above the price of untreated rail. B&O engineers decided to try out the heat-treated rail on curves in the territory of heaviest rail wear. The first installation was made about eighteen months ago. To date a total of 1200 tons of the rail, all of the 140-lb RE section, has been inserted in the eastbound tonnage track on both the Cranberry (ascending) and the Seventeen-mile (descending) grades.

### **Purpose of installation**

Primary purpose of the installations on the Cranberry grade is to determine the performance of the heat-treated rail in resisting crushing of the low rails and head wear of the high rails. On the descending grade the main purpose is to find out the extent to which the heattreated rail will resist flange wear on the high sides of curves. As a basis for judging the effectiveness of the treated rail it is given a formal inspection twice annually, in January and again in July, during which contour tracings are made.

On the downhill grade the in-

spections have revealed a very slight amount of shearing on the high rail and no wear on the low rail," says Mr. Caywood. "On the uphill grade there's no evidence of any crushing or wear at all to date," he adds. Mr. Caywood also points out that no complaints of excessive wheel wear have been received from the mechanical department since the heattreated rail was installed.

### Will install 500 tons in 1961

In view of the additional service life being obtained from the heattreated rail B&O engineers are convinced that the added cost is justified by the savings in labor and material. Plans are to install an additional 500 tons of the rail this year. "What we would like to do," explains Mr. Caywood, "is to lay 1000 tons of it each year until we have heattreated rail in track at all locations where we consider its use economically justified."

Installation of the heat-treated rail is being carried out in conjunction with a program to install rail and flange lubricators on the Seventeen-mile grade. It is in this stretch that the combined effects of the heat-treated rail and the lubricators are expected to result in a service life for the rail eight times that obtained from untreated rail without

lubricators.

# Other installations of heat-treated rail

In addition to its use on the B&O, fully heat-treated rail is under test on various roads and is in regular use on

For 11 years the Rail committee of the AREA has been making regular reports on test installations of fully heattreated rail on a number of roads, including the PRR, C&O, N&W, NYC and GN. The first of these was an installation of 155-lb PS rail on the PRR, which was installed in a 6-deg

Curve at Forge, Pa., in January 1949. Other installations of fully heattreated rails have been made by a number of railroads, including the Erie-Lackawanna, Jersey Central, Clinchfield, P&WV and Reading. Subway systems at Chicago, Toronto, Bos-

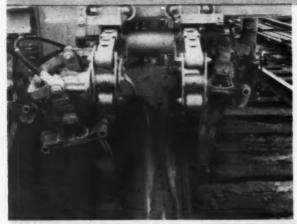
ton and New York are also using it.

According to G. G. Knupp, assistant metallurgical engineer of Bethlehem Steel Company, the service life of fully heat-treated rails in these installations ranges from at least 2 times up to 7 times and more that of non-heat-treated rails previously installed in the same locations. Since some of the original test installations are still in service the "life ratio in some cases is still increasing," he adds.

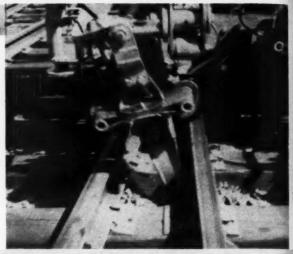
Aside from the B&O the use of heattreated rail has passed beyond the test stage on at least two roads, says Mr. Knupp. On the N&W heat-treated rail is standard for use in main-track curves of 6 deg and over, and on the GN it is standard for use on curves

of 4 deg and over.

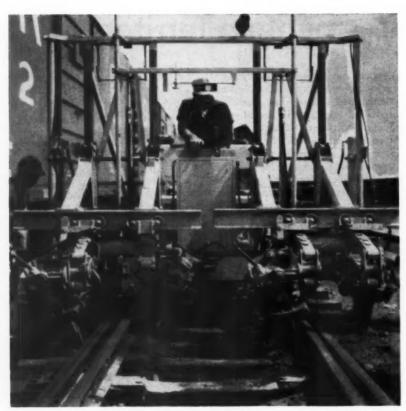
# How yard tamper does the job . .



AT FROG . . .



NEAR HEEL OF FROG . . .



ROLLERS on beams permit workheads of tamper to be moved transversely as necessary.

Engineers of the Portland Terminal Company felt there was a need for a tamping machine specially designed for surfacing through leads and along ladders in terminals. Told here is the story of how such a machine was developed and how it has performed in surfacing more than 100 turnouts as well as a considerable amount of sidetrack since last May.

# Tamper

• Since May of this year the Portland Terminal Company has been trying out the pilot model of a tamping unit designed specially for yard work.

Up until the end of the third week in August the road had surfaced about 107 turnouts with the machine, as well as a considerable amount of side-track. As a result of this experience, says J. W. Wiggins, chief engineer, "we have found that in tamping leads we are able to tamp all of the switch timbers in the lead from the head blocks to the heel of the frog."

He adds that there are three or four ties which are interlaced behind the heel of the frog which cannot be tamped, but points out "there would not be any way of tamping these ties except from the ends with a hand bar."

Interest in a tamping machine designed specially for yard work first developed on the Portland Terminal last year, according to Mr. Wiggins. It was concluded that a machine that would do "a proper kind of job through leads and along ladders" was necessary for the road's use in such locations as its Rigby yard. This need was brought to the attention of Jackson Vibrators, Inc., with the result that a pilot model of the type of machine desired was developed during the winter of 1960-61. It is



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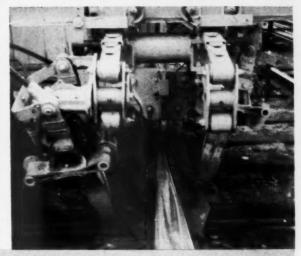
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AT FROG WITH INTERLOCKING RODS

# modified for yard work hikes output

this model that has been in service since last May.

The "yard tamper" is a modified version of the Jackson Jack-Spot tamper. The latter machine has two independent work heads, each of which carries two tamping units in cross-tamping position (diagonally across the rail and tie). The tamping blades are of the double-blade type. For jacking the track the Jack-Spot has two hydraulic rams, one outside the rails on each side.

To adapt the Jack-Spot tamper for yard work major revisions were made in the workheads. Each pair of tampers was mounted together on an auxiliary workhead which in turn was hung by means of rollers from a transverse beam forming part of an independent crosshead. By means of an hydraulic ram each work head may be moved back and forth laterally on its supporting beam to place the tamping tools in the desired position for tamping at the particular location.

Another change was to replace the double tamping tools with single blades. The latter are 26 in long and have ¾-in working edges. The mounting for the blades is such that as each blade penetrates into the ballast the angle of slant becomes progressively greater. According to the manufacturer, this feature, plus the unusual length of the blades,

makes it possible to do a thorough job of tamping under large frogs.

Commenting on this feature of the tamper Mr. Wiggins explained the railroad had concluded that "the tamping of the ties with the staggered spuds is effective in forming a compaction under the ties from 18 in inside the rail out to the end of the tie."

To make it possible to use the single tamping blades it was necessary to remove from the motor base the regular adapter plate as used with the double blades and to replace it with a different one for the single blade. However, when it is desired to use the machine for other types of work, such as spot tamping or jack tamping, it is said to be a simple task to replace the standard adapter plate and attach two of the regular tamping bars.

In modifying the Jack-Spot tamper for yard work another change was to replace the existing tamper motors with the more powerful motor that is used on the Jackson Track Maintainer.

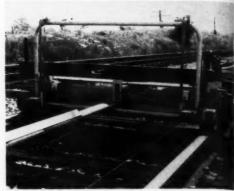
On the Portland Terminal the forces used with the Yard Tamper, explained Mr. Wiggins, consist of a foreman, one machine operator, and usually three trackmen, depending on the need for shoveling ballast in to feed the tamper and trimming behind it.

"This piece of equipment," he said, "meets a need in our yard maintenance work which increases our production effort in surfacing leads by at least 100 per cent, with half as many men." When doing this kind of work and if the track is available the experience has been, said Mr. Wiggins, that "we can surface from three to four complete leads in six to eight hours."

"It is not economical," he adds, "to use this equipment in open track if considerable work is to be done of that nature. The reason it is not economical is because each head has to be positioned twice in order to get the proper compaction, hence, using it in this manner requires twice the length of tamping time as is required by the use of a conventional Jackson Maintainer."

At the time the subject of a yard tamper was proposed the Jack-Spot tamper was the only machine in the Jackson Vibrators line that could be modified for this purpose. Since then the company has put its two Utility Tampers on the market. Of these, the Model 260, which is powered with a diesel engine and has the more powerful vibratory tamping units, has been selected for modification into the Yard Tamper. As far as the inclusion of jacks is concerned this will depend largely on the desires of the customer.





LEFT—Foreman stops the Nordberg Midget Surfacer when pointers reveal a low spot. Tie at low spot is then jacked and tamped.

ABOVE—Here a pointer shows the joint in the left rail is slightly more than 1/8 in low. Right rail is slightly less than 1/8 in low.

# How one road

Spot-tamping work on the Erie-Lackawanna has been mechanized on a system-wide basis. This is being done largely through the use of teams of equipment, each consisting of a spot-tamping machine and a Nordberg Midget Surfacer for "sighting" the low spots. The work is done by the section forces. The result, say E-L officers, is that the section forces are doing more spot tamping work and are doing it more uniformly than would be possible if the sighting were done by eye.

• Last fall the Erie-Lackawanna was faced with the problem of doing more spot-tamping work with its available manpower.

The problem came about when the road lengthened the territories of its section gangs on a systemwide basis. Previously these gangs had done spot-tamping work using hand-held pneumatic tampers or tamping guns of the gasoline-driven self-contained type. Sighting was done by the foremen by eye.

Now it had become necessary to place in the hands of the section gangs equipment that would make it possible to keep up with the increased amount of spot-tamping work that had to be done by individual gangs. Another aspect of the problem was to provide equipment that would make it possible to do a more uniform job of spot tamping over the road as a whole.

To achieve these ends it was decided to purchase the required number of Fairmont and McWilliams spot-tamping machines and to obtain for use with them a number of Nordberg Midget Surfacers. The latter are wire-type "sighting" devices designed primarily for locating and correcting irregularities in track surface. The "sighting" wires, mounted on two-wheel buggies, are 50 ft long. An assembly containing a scale and pointers for indicating and measuring irregularities is mounted on a four-wheel buggy placed 20 ft ahead of the rear

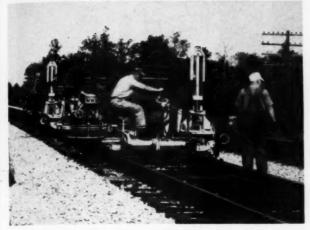
Twenty-one of the Nordberg

Midget Surfacers were obtained. These were delivered shortly before the close of the 1960 working season and from one to four of them were assigned to each division. Since the spot tampers had not yet become available several of the Midget Surfacers were teamed up with production tampers engaged in spotting work. But when the spot tampers began to be delivered in April of this year the Midget Surfacers were assigned for use with them. The road now has 38 Fairmont and 7 McWilliams spot tampers.

# How used on one division

The road's Marion division affords an example of how these machines are used. This division has approximately 250 miles of double track and 60 miles of single main track. It is maintained by nine main-line sections, seven of which were each assigned a spot tamper. The two sections which did not receive one of these machines include a terminal gang and a section where the track is used jointly by the E-L and the C&O. On this section the frequency of trains is such that the use of spot tampers is impracticable.

For use with the spot tampers, three Midget Surfacers are assigned to this division. These are distributed among the sections at the direction of the division engineer. As



TWO FAIRMONT spot tampers working in tandem. One of these, not otherwise occupied, was brought from an adjacent section.



McWILLIAMS spot tampers are used on some sections. Spottamping outfits get about 5 hr of on-track time each day.

# mechanizes its spot-tamping work

quickly as a Midget Surfacer has served its purpose on one section, it is moved to another. At the time they were recently inspected in operation the three Midget Surfacers were being used on track which is scheduled to be timbered and surfaced next year.

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The normal section gang on the Marion division is comprised of a foreman, machine operator, truck driver and three trackmen. Frequently, the gang will have an assistant foreman, in which case there will be one less trackman. When working on double-track territory, one of the trackmen or the truck driver is assigned to flag; on single track lines or CTC track, the gang uses the track under a work order. When the work was recently seen in progress, the truck driver was serving as the flagman, the foreman and two trackmen were working with the Nordberg Midget Surfacer and the operator and one trackman were doing the tamping work with the spot tampers.

### Low spots raised 1/4 in high

When working with the Midget Surfacer, E-L practice is to push the device along the rails until one or both pointers of the indicator show a low spot of at least ¼ in. Deflections less than this amount usually are not raised. The device is then stopped and the tie at the

lowest point is jacked up until the pointer shows it to be ¼ in high. This amount of over-raise is considered sufficient to allow for the settlement which occurs in stone ballast under the first train.

One trackman (or assistant foreman) pushes the Midget Surfacer and the other trackman handles the track jack. The foreman watches the pointers of the indicator and marks the ties to be tamped. Usually, five or six ties must be tamped to eliminate a low spot.

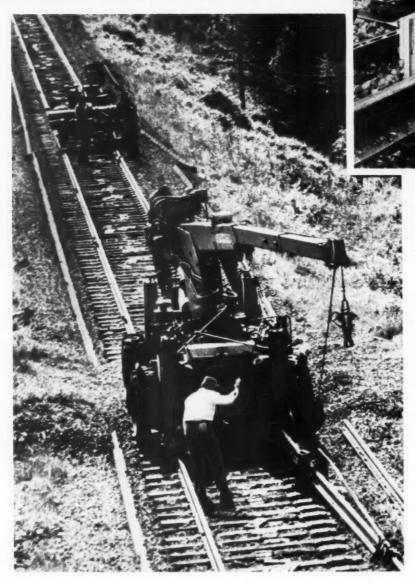
The tamper operator makes from one to four insertions of the tamper tools at each tie to be tamped. The ties farthest from the lowest spot will receive from one to two insertions and those at the low spot three to four. The trackman accompanying the tamper forks stone ballast to the tamping tools. He also assists in turning the machine, in the case of the Fairmont tamper, and in placing the machine on a set-off when necessary to clear the track.

In general, only slightly over 5 hr of on-track time can be expected because of the time lost in clearing for trains. From one-half to a mile of track is worked over per day.

A portable metal set-off is used with each tamper and is so located that the machine never has to run more than a mile to clear for trains. When short moves are made from one work site to another, the tamper usually is run under its own power to the new site. However, for moves of 10 miles and longer, the machine will either be towed by a truck having a flanged-wheel attachment or loaded onto the truck for highway travel.

"This equipment," stated R. H. Jordan, division engineer of the Marion division, "will enable our forces to do more and better work. Not all foremen sight track in the same way and the Midget Surfacers should give us greater uniformity. The same thing is true for our tamping. The hand-held tampers were used differently by the individual workers. Machine tamping results in a more uniform quality of work and greater production."

The road hopes to use the Midget Surfacers and spot tampers for types of work other than spot surfacing. It is visualized, for example, that the Midget Surfacers will be helpful for removing deflections between a tamping jack and the production tamper on out-of-face surfacing jobs. The tampers, it is felt, can be used in connection with work involving the digging-in of crossties and for tamping through highway crossings as they are rehabilitated. It is also contemplated that the IR-36 air compressor of the Fairmont spot tamper can be used to supply air for tamping switch ties with air tampers, as well as the timbers under railroad crossings.



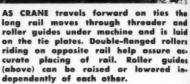
Lays welded rails with modified crane

 Rails welded into quarter-mile lengths are being laid in track on the Seaboard Air Line with the aid of a rubber-tired crane which has been modified by the railroad to adapt it for this operation.

The machine used is an Austin-Western 7-ton hydraulic crane equipped with four-wheel drive and a telescoping hydraulic boom. The unit had already been fitted by the

road with flanged wheels so that it could be operated on track in connection with bridge-repair work.

To adapt the crane for laying long rails the wheels were removed from one side and replaced with two roller-equipped rail guides, one in the front and the other at the rear. The flanged wheels on the other side were replaced with double-flanged wheels.



To lay a length of rail that has been unloaded alongside the track the crane is positioned on the track with its wheels resting on the ends of the ties. With the aid of tongs hung from one of the crane's two boom lines one end of the rail is inserted into a threader hung from the other boom line, and through the front and rear guides under the crane.

As the crane moves along the track the rail, moving through the threader and the guides, is picked up and laid in position on the tie plates. This operation is facilitated by the fact that the rail guides are installed on hydraulically controlled retractable steel support columns. Thus they can be raised and lowered independently of each other. This arrangement makes it possible to raise the front rail guide high enough to permit the incoming rail to clear the ties. On the other hand the rear guide is in a lowered position so that rail fed from the rear of the machine is as close as possible to the tie plates.

Experience on the Seaboard is that the modified crane can lay a quarter-mile length of rail in less than 20 min after the preliminaries have been completed.

Other equipment used in laying rail on the Seaboard includes Nordberg gaging, spiking and adzing machines, a Fairmont tie spray machine, and compressors mounted on Patton self-propelled carriages. Another unit, modified by the railroad, includes a belt-driven broom for clearing the ties of ballast before new tie plates are placed.

# How to make underwater repairs

• Inspection and sounding records of masonry structures will indicate the need for further exploration, using a diver, to plan for making effective repairs at minimum cost.

Two types of repairs and protection to masonry structures that will preclude more extensive and expensive work when performed in time are: (1) Pressure pointing and grouting of stone masonry substructures; and (2) scour protection and repairs to masonry.

# (1) Pressure pointing and grouting of stone masonry substructures.

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This work may be performed economically where the bed of the stream is not more than 15 ft below mean tide or normal water level. The current or flow of water should not exceed 3 mph at streambed to allow a diver to seal open joints in the stone with a minimum of interference. This treatment is performed on structures where the mortar has broken out of the joints, or where the stone is working or spalling at the joints, and to repair deterioration at the water line. The structure should have reasonable penetration in the streambed.

The underwater work is performed by a diver and his tender. The present minimum cost for this service is \$120 per day. The equipment consists of mechanical staging with hoists, air drills, air chipping hammers, pipe lines, hoses, cement gun and grout pump, supplied by a 300-cfm (minimum) air compressor, or the equivalent. The other force, required to perform the work of supplying the diver and working on masonry above water, consists of a foreman and six men. The equipment and material is best handled on a light barge, unless land is within reasonable distance where the compressor may supply air by pipe line to storage tanks at the pier. A motor car with trailers will handle material to the site of the work. A Burro or rail-highway crane will serve part time.

Underwater joints are packed with oakum and sealed with lead, all of which is applied with air chipping hammers with suitable points that will properly enter the joints.

By W. B. Warfield, supervisor of structures Pennsylvania-Reading Seashore Lines

What is the best work procedure for making underwater repairs to masonry substructures? When this question was recently posed by our "What's the answer?" editor, the accompanying article by Mr. Warfield was among the answers received. Because of its scope and the detailed manner in which it deals with the subject of underwater repairs, Mr. Warfield's answer was withheld for publication as a feature article.



Plastic material now used for raising ships in underwater salvage operations, is available and suitable for sealing and protecting joints in stone masonry. This material furnishes a positive and permanent seal, and hardens in two hours.

During the underwater sealing, the pressure pointing and drilling operations are progressed above water. The cement gun is used for applying a mixture of 1½ parts of mason sand to 1 part of cement, with the water mixing at nozzle and the air pressure adjusted to provide a suitable flow of mortar to the joints.

Safety is of first importance in the

successful completion of any job. There must not be any work performed in the area above the divers that would cause injury or damage to their lines.

The stretcher stones in the first course clear of the streambed and in every third course to the top of the operation are drilled with an air drill. The holes are staggered in each course and spaced approximately 10 to 12 ft on centers horizontally.

A 25%-in bit is first used to penetrate the stone sufficiently to insert 2-in I.D. pipe nipples, approximately 24 in. in length. Beyond the position of the nipple, worn bits 134-in

# How to make underwater repairs cont'd

to 2¼-in. in size can be used to complete the holes into the core of the masonry substructure.

The nipples are threaded at one end for attachment to vent and grout hoses, and are sealed and locked into position with two pointed lugs welded to the insert end. When the nipple is given a quarter turn the lugs grip the stone.

The grouting is progressed in a manner similar to the above-water operations. The grout hose is centered between two vent hoses in the bottom course and one to three vent hoses in the above drilled course. The other nipples are sealed with pipe caps, and are used for testing, as vents or for grouting as the work progresses.

The sealing should prevent the entrance of water and be of sufficient strength to resist a blow-out during the work or when air pressure of about 60 psi is applied initially to de-water the area as far as possible. Grouting pressures range from 65 to 85 psi.

Many important structures, where the piers have been constructed of heavy ashlar masonry exteriors and have cores filled with rubble containing little or no mortar, may be restored to good condition by this treatment.

# (2) Scour protection and repairs to masonry.

This work is necessary where the stream or river bed has eroded or settled to a point close to the bottom of the foundation and the remaining material is neither sufficient nor reliable for proper support.

Foundations not constructed on piling or anchored in rock are especially in need of close inspection to determine when this type of protection is necessary.

Records of flood damage, rate of flow and streambed erosion are the governing factors which will indicate the time for this protection, based on the distance between the bed of the stream and the bottom of the foundation.

The "Z"-shaped section of steel sheet piling is designed to support safe loads at cofferdams used for the construction or repair of piers and abutments when the depth from the water surface to the bed of stream.

is 18 to 40 ft. Piling of a different and lighter design may be used where the depth of water is less than 18 ft. The "Z" piling range in weight from 27 to 38 lb per sq. ft.

Steel sheet piling is the best material to use in construction or repairs, as it requires less bracing and is suitable as a form for concrete and permanent protection. Time is saved due to less leakage and pumping

Piling must be driven to refusal when it is not possible to obtain the required minimum penetration. When this occurs, boring tests of the material on which the piling rests should be made to determine if the piling is sufficiently supported against lateral movement.

Sheet piling driven against sloping rock could ultimately develop a sliding movement if the material through which it penetrates has a poor binding factor or contains a high percentage of sand free from boulders, stone or clay.

The pile driving should be started at the upstream end of rivers and at the point of least flow in tiddal currents. The piling should be driven alternately in segments of approximately five sections on each side of pier. This will equalize the forces of vibration and lateral pressures in soil and reduce the possible movement of the pier.

The distance between the neat line of the pier and the sheet piling should be sufficient to permit mechanical excavation to grade at the bottom of the pier. The last few inches should be excavated by hand and cleared of any muck to receive the concrete. Also to be considered is the slenderness of the pier; one of older design may be strengthened by adding more support below the water line. This will also be a factor governing the distance between the pier and the sheet piling. The loadbearing quality of the soil will also reveal the need for tubular steel piling in this area.

When scour is present under part of the footing, additional bracing should be added between the pier and sheet piling, equal on each side. Reinforced-concrete bearing blocks, 18 in square and approximately 6 in thick, should be ready to insert where needed. Also, sections of 8-in "H"-columns, in lengths as required

and having bearing plates top and bottom, are to be wedged with steel wedges between the bearing blocks and the bottom of the foundation. This area is then shored off by creosote-treated timber and stepped to meet a level bearing on hard packed soil. Concrete should be placed immediately.

The pier should then be cleaned as much as practicable of any deteriorated masonry, reinforced as needed and 4000-lb Type WC 6 concrete poured.

In navigable waters, floating equipment is most desirable since it does not interfere with bridge traffic nor result in loss of time clearing for trains. Where movable bridges are involved and the clearance above water is insufficient to perform all the work, it then becomes necessary to obtain use of the track and open the bridge.

Various problems are sometimes encountered when driving in close quarters under girders or ballasted deck bridges. It is often necessary to splice the piling in sections as driven and it is well to support the hammer on a steel beam and frame with rigging to permit free operation and power as when handled by a crane.

Concrete may be conveyed to the site by Pumpcrete equipment or material may be supplied to a 2-cu yd mixer (n a barge.

The pile hammer should produce not less than 4150 ft-lb energy per blow. This will require a 35-hp steam supply boiler or 450 cfm of compressed air.

Dewatering of a cofferdam after the bracing is in place is best accomplished with a homemade air lift, constructed of a 6-in to 12-in I.D. pipe. The pipe must be long enough to extend from the bottom of the pit to the top of the sheeting, with a port out in the stream. The bottom of the pipe is to be beveled to permit the entry of water when forced by air through a 1-in pipe terminating at a point about six inches above the beveled end of the larger pipe. This will produce a discharge of 400 to 1000 gpm.

Similar treatment may be applied to pile-supported piers which require more stability.

How to dewater cofferdams—See "What's the answer?" department, page 68.

**Imitation** may be a sincere form of flatterybut when you buy rail anchors insist on the real thing-the

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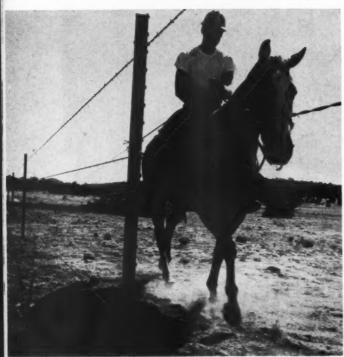
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# MID-WEST FORGING & MANUFACTURING COMPANY





# Disneyland triples length of monorail

The Disneyland monorail at Anaheim, Calif., has been extended 8,767 ft, giving it a total length of 12,300 ft. Purpose is to connect the park with the Disneyland hotel. In addition, three new 106-passenger four-car trains have been placed in service. The system, said to be the first passenger-carrying monorail to operate daily in America, was opened in 1959 and has carried 4,370,000 passengers a total of 60,000 miles.

# News briefs in pictures . . .

### Santa Fe constructing another big line change

A 38-mile single-track line change is under construction (below) by the Santa Fe between Abra, Ariz., and Skull Valley, on the road's Phoenix branch. Located southwest of the 44-mile line change which was placed in service last December and about 10 miles west of the existing track, the new line will cost approximately \$3.5 million and will reduce the length of the branch by about 14 miles. Continuous welded rail will be laid on the completed roadbed. Barbed wire for the right-of-way fences normally is strung out by a truck but on the rougher terrain horses are used for this work (left).





# WHY IT COSTS LESS TO OWN A CAT GRADER

Most motor graders look pretty much alike, no matter who makes them. They handle similar jobs, too, and it isn't always easy to see any big difference in the way they handle them. In fact, the manufacturer's suggested prices usually are not greatly different for machines of nearly equal specifications—regardless of the "deal" that may be offered a buyer. But used motor graders vary considerably in price. Why?

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# The Buyer Determines Price

A used machine is priced at what the buyer is willing to pay . . . it's a measure of what he thinks is left in a machine. So, with used equipment, the buyer sets the price. This is clearly demonstrated at used equipment auctions. A check of auction prices throughout the country shows, for example, that the Cat No. 12 Motor Grader brings substantially higher prices than comparable machines of other makes-as much as 80% more. (Only machines of the same age, same condition and with similar attachments were compared.) What makes a Cat Motor Grader more desirable than other makes?

### A Feature That Affects Cost

Any machine is desirable if it is known to be dependable. This reputation can only be the result of true quality design and quality construction. The Cat oil clutch is a good example. It was designed and is built to give long, trouble-free life. But, how well does it do it? Let's examine the records of just one Caterpillar Dealer who has 161 oil clutch-equipped motor graders in his territory. His records show that in four years he has sold only \$24.38 worth of parts for motor grader oil clutches! One machine in his territory went 2524 service meter hours without any work on the clutch. Many users report 2000 hours of service before the first adjustment. In 1000 hours of operation only about .0025 inch of wear can be expected-less than the thickness of a human hair. And, since all parts are constantly bathed in oil there is no need for lubrication maintenance. Less wear, less attention mean not only lower total repair costs but more time on the job ... less down time. Of course, the oil clutch is just one example of many quality features in Cat Graders.

### A Look at Total Cost Records

The cost records of private owners and governmental bodies show which machines cost less. For example, an Indiana county keeps individual cost records on their six motor graders, 14 trucks, three loaders and five tractors.

Their records showed that a year-old No. 12 needed only a set of head gaskets and two spark plugs with \$25 labor, while two newer graders of another make needed major engine repairs, new clutches and side shift linkage. One town in New Hampshire reports that in over 20,000 hours, their No. 12 has never had a breakdown that held up work more than three hours. Operating costs-24¢ per hour exclusive of fuel, oil and operator. Comparing a Cat No. 12 to another make (after 31/2 years' service), the records of an Arkansas county showed a saving of \$2478.57 in parts and labor for their No. 12.

### What's in It for You

Others have proved that Cat Motor Graders cost less in the long run because they are built better in the beginning. Your Caterpillar Dealer has additional facts and figures on low-cost operation of Cat Graders in your area. Ask him for free Cost Record Books so that you can keep individual machine records on your equipment. Prove to yourself that it costs less to own a Cat Grader.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

# CATERPILLAR

RAILWAY TRACK and STRUCTURES

# STRUCTURES

# **PRODUCTS**

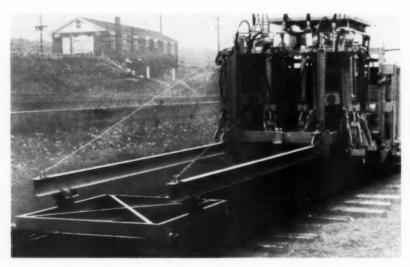


Designed for station bus . . .

# **Hy-Rail** equipment

FAIRMONT Hy-Rail equipment now can be fitted to the Ford Econoline Station Bus to enable the unit to travel either on highways or railroad tracks. The bus has a load capacity of 1400 lb and has room for eight men when equipped with second and third seats. The Hy-Rail equipment can be installed by the railroad or the bus can be purchased with the rail equipment in place. The manufacturer states that some body modifications are necessary at the lower front corners to make room for the guide wheels when they are in the raised position. A hydraulic turntable is available as an extra. Fairmont Railway Motors, Inc., Dept. RTS, Fairmont, Minn.

(Circle 200 on TIME-SAVER card, page 77)



Raise low joints with . . .

### Surfacing device

A NEW device is available for surfacing low joints. Designated the RMC Joint Surfacing Device, it is designed to give direct readings of low joints to the operator of a jack tamper. The device consists of two 14-ft aluminum beams, one over each rail, attached to the front end of the jack tamper. The front end of the beams are supported by a four-wheel cart. Readings are given for each rail in-

dependently of the other by means of spring tensioned cables attached to the ends of the beams. Railway Maintenance Corporation, Dept. RTS, Pittsburgh, Pa.

(Circle 201 on TIME-SAVER card, page 77)

For spot-tamping work . . .

# **Compact tamper**

THE MATISA principle of vibratingsqueeze tamping now is available in a machine that is claimed to deliver twice



the power at half the weight, twice the speed at half the labor and twice the efficiency at half the cost as the company's SpeedTamper. Designated the "Compact Tamper," the machine is designed to be used for spot-tamping and smoothing operations, yard maintenance and out-of-face raises. In addition, the manufacturer states that the unit is rugged and fast enough to work as a main-line production tamper for small railroads. The Compact Tamper is equipped with independently controlled tamping heads with ball-type rail clamps. The jacks can be operated independently or together.

The new machine is powered by two air-cooled Wisconsin engines which develop 12.5 hp at 3000 rpm. It is propelled along the track at speeds up to 20 mph by a hydraulic motor and a three-speed transmission. The machine weighs 5,200 lb. A large hydraulic jack is located at the center of the tamper for lifting it clear of the rails for setting it off the track. Matisa Equipment Corporation, Dept. RTS, 1020 Washington Ave., Chicago Heights, Ill.

(Circle 202 on TIME-SAVER card, page 77)

For testing track conditions . . .

### Inspection car

A NEW mobile laboratory for determining track conditions has been introduced by the National Cylinder Gas Division, Chemetron Corporation. Known as the NCG-Amsler track inspection car, it is the first of a series of products manufactured by the Swiss firm of Alfred J. Amsler & Co. to be marketed by NCG. The latter company has obtained exclusive rights to sell and service these products in the United States and Canada.

The track inspection car is designed simultaneously to measure gage, cross level, gradient, curvature, twist and distance the car has traveled. Measurements are continuously recorded in U. S. units on a single roll of paper. In addition to

(Continued on page 56)



# **How GRACO Hydra-Spray** cut building painting costs for the Pennsylvania Railroad

When someone cuts painting costs to less than a fourth of what they were seven years ago, you've got to admit that this is a tremendously significant saving. Indeed, it's almost unbelievable!

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Yet, that's exactly what the Pennsylvania Railroad did when it recently repainted its Harrisburg, Pa., station (illustrated above) using new airless GRACO Hydra-Spray equipment.

The cost? \$4,638,15. The 1953 cost for the same building and the same square footage? \$20,000. Check the company's own report . it's reproduced directly to the right.

Moreover, the airless method of Hydra-Spraying your paints and other protective coatings provides other big benefits as

- It virtually eliminates overspray.
- · Allows heavy film build-up.
- · Eliminates pin-holing.
- · Gives high penetration on rough surfaces and full coverage in recessed areas . . . without excessive solvent reduction.

Ask your Graco Railway Representative to tell you more. Write or call him today.

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# SPECIAL COST REPORT ON STATION PAINTING AT HARRISBURG, PA.

# THE PENNSYLVANIA RAILROAD Philadelphia / March 7, 1960

SUBJECT: Spray painting of interior of passenger station at Harrisburg, Pa.

Total coverage, 103,070 sq. ft. Recently the above subject station was spray painted (with new Graco equip-ment) by our own forces—one foreman and four painters—during their regular tour of duty 7:00 A.M. to 3:30 P.M. for \$4,638.15.

In the year of 1953 this same station was brush painted for \$20,000. We are unable to say what the size of the force was at that time, but we do know that it was painted during off hours, therefore causing overtime.

### BREAKDOWN OF COST

(Labor and Materials to paint 103,070 sq. ft.) Forces

One foreman and four painters January

160 manhours @ \$3.08 per hr......\$ 492.80 February 664 manhours @ \$3.15 per hr...... 2,091.60

MATERIALS White.....\$ 990.00 472,50 Seafoam green..... Aspen green..... 225.00

Bench green enamel..... 31.25 Varnish.... Diesel fuel oil..... 49.00 240.00 TOTAL....\$4,638.15

Coverage per gal. of paint...approx. 270 sq. ft.

Cost per sq. ft.....\$.045



determining track conditions for programming maintenance work, it is stated that the car also can be used to verify the effectiveness of the work.

NCG also plans to market a small manually propelled track-inspection unit for performing local measurement work. This device is designed to be easily lifted off the track. National Cylinder Gas Division, Chemetron Corporation, Dept. RTS, Chicago, Ill.

(Circle 203 on TIME-SAVER card, page 77)



Capacity of 1500 lb for . . .

# **Portable Dolly**

A LIGHTWEIGHT dolly is available for transporting tools and supplies along the track. Designated the Model TD-3 Kari-Kart, it weighs 88 lb, has a capacity of 1500 lb and can be quickly dismantled for carrying. The Kari-Kart consists of a tubular steel frame with a 36-in by 24-in expanded-metal platform, double-flanged load wheels and an outrigger with a single-flanged wheel. All wheels are insulated and have sealed, pre-lubricated ball bearings. A tubular handle is provided which can be used at either end of the Model TD-3. The Nolan Company, Dept. RTS, Bowerston, Ohio.

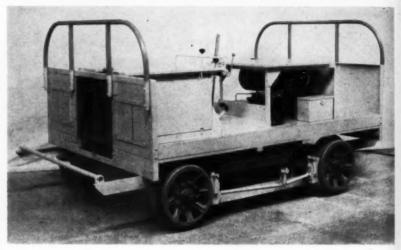
(Circle 204 on TIME-SAVER card, page 77)

### Crop rails in track with . . .

# New machine

THE RACINE "Krop-Master" now can be equipped with two rail saws and two rail drills to enable the machine to make a complete joint in track in one operation. The manufacturer states that in a recent test six holes and a saw cut were made consistently in 12 min. The machine uses a "fixed" position drilling head which is claimed to assure accurate alinement. The head can be arranged to drill holes on 5½, 6, 6½ and 7-in centers. The rail





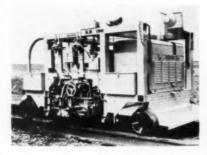
Improvements made to . . .

# Gang cars

TWO improved medium-duty gang cars are available. One, the A5 Series E, is powered by a 4-cylinder, 35-hp engine. The other is designated the A4 Series D. It has a 4-cylinder, 48-hp engine. Both models have sheet steel end panels which

extend the full width of the car up to the level of the seat. Each car is equipped with a clutch, 4-speed transmission, propeller-shaft drive and an enclosed-axle reverse gear. Standard equipment on the gang cars includes an oil filter and a 12-volt electrical system. Fairmont Railway Motors, Inc., Dept. RTS, Fairmont, Minn.

(Circle 206 on TIME-SAVER card, page 77)



saw on the machine is fed hydraulically. The Krop-Master is self-propelled and can travel along the track at speeds up to 20 mph. It is equipped with built-in jacks to assist in setting it off the track onto a prepared setoff. An engine generator set is provided for powering electric tools, such as grinders, impact wrenches, etc. Racine Hydraulics & Machinery, Inc., Dept. RTS, 2000 Albert St., Racine, Wis.

(Circle 205 on TIME-SAVER card, page 77)



Self-propelled cart for . . .

### Track surfacer

DEVELOPED for use with the Super Jack-All, the new Kershaw motorized telescopic track surfacer consists of a self-propelled cart, telescope and seat for the operator. To surface track the cart oper-



Atlantic Coast Line passenger shelter:

# dramatic row of concrete "umbrellas" completed for just \$1.65 per square foot

Sixty concrete shells-each 16 ft. square and with the distinctive double curvature of the hyperbolic paraboloid-form this Lakeland, Florida, passenger shelter. The repeating shells, precast on the site and erected on concrete columns, provided significant savings.

The unique geometry of the hyperbolic paraboloid produces curves that are developed entirely from straight lines. No bending or curving of form lumber required. Forms are inexpensive-and with repeated use just a few are needed. For this attractive shelter, the \$1.65 per sq. ft. cost included the roof, columns, footings and drainage!

Today, progressive railroads are finding that modern concrete provides new beauty and construction

economies along with the time-tested advantages of durability, fire safety and low upkeep. Write for free

literature. (U.S. and Canada only.)

PCA lob tests show strength of concrete shells. Here, engineers subjected a 24-ft. square by 1½-in. thick shell to 13½ tons total downward load-applied by jacks beneath the floor.

### PORTLAND CEMENT ASSOCIATION

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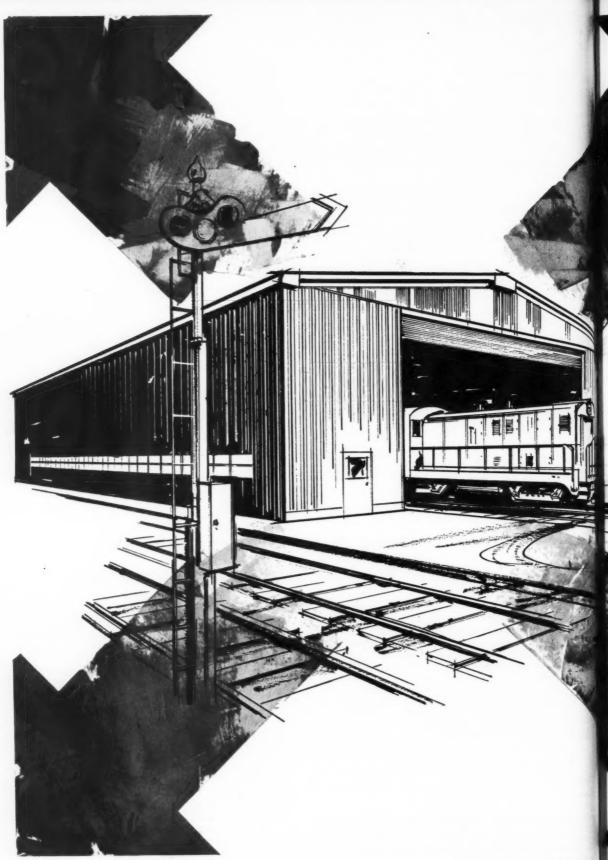
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# If you want this 4-Way Economy, you'll want an Armco Steel Building

Here are four key economies offered by the new line of Armco Steel Buildings:

Economy of selection. Because of the much wider selection in widths.

**Economy of selection.** Because of the much wider selection in widths, heights and building styles, you can specify the structure that matches your requirements exactly.

**Economy of expansion.** When you need more space, you simply order framework and panels to match your original structure. Remove an endwall, add new framework and panels, replace the endwall. Your investment is never more than your current needs.

**Economy of construction.** Within days or weeks, your structure is up. Regardless of size, construction is a simple matter, easily handled by rail-road crews. If you prefer, Armco will quote you the price of your building complete and ready to use. Framework arrives ready to erect. Wall and roof panels interlock and are permanently secured by only **two** bolts in each panel.

Economy of maintenance. Weathertight wall and roof panels assure long service life with minimum maintenance. Temperature-control is no problem. Your Armco Building is supplied hot-dip coated with zinc or aluminum. Mill-applied color coating is optional.

For full information on how Armco Steel Buildings can meet your needs, just fill in and mail the coupon. The Armco Sales Engineer in your area will be glad to supply you with technical data, prices and delivery dates.



Strength, Economy, Versatility







UCTURES

ARMCO Drainage & Metal Products

# STRUCTURES WHAT'S THE ANSWER?

# Testing rails for internal defects

When scheduling the operation of a rail-detector car, what factors determine when rail should be included in the test? Explain. Are control-cooled rails included in the test?

### Tests control-cooled rail

By W. E. CORNELL Engineer of Track New York, Chicago & St. Louis Cleveland, Ohio

On our road we test controlcooled rail and we follow the practice of skip testing. The rail to be tested is determined largely on the basis of age of rail and whether there has been any service failures from transverse fissures. Also, we do what I like to identify as "spot checking" by testing short stretches of one-half mile or less of newer rail where such short stretches are between two testing territories.

In considering the question of where and when to test, the rail is first divided into two general classifications-control-cooled rail and rail that is not control cooled. After this general classification, consideration must be given to the tonnage carried, speed of trains, and class of trains. If tonnage and other traffic factors are sufficient to justify testing, I feel that all non-control-cooled rail should be tested as frequently as service failures or detected defects appear to justify.

For the control-cooled rail, I feel that the age factor can be given greater weight and testing deferred until wear and other effects of traffic may indicate the need for testing. In addition to the age and traffic factor, consideration should be given to maintenance condition of the track structure as a whole. This would primarily include line, surface and number and severity of engine burns, whether welded or not welded.

## After five years in track

By C. O. CONATSER Assistant Engineer Illinois Central Chicago

When scheduling the operation of rail detector cars, three factors should be considered: (1) Prevalence and type of defects; (2) section and date of rail; and (3) traffic density and speed of trains.

I would not recommend the operation of detector cars on the lighter sections of rail (75 and 85 lb) any more often than once each year. These lighter sections of rail are less prone to develop transverse defects; however, they do develop joint and other defects which can be detected by visual or other means.

For rail sections 90 lb and heavier, rolled prior to the advent of controlled cooling, prevalence and type of defect, traffic density and speed, plus the availability of a detector car, should determine the number of tests per year. Two tests annually should suffice except in extreme cases.

Controlled-cooled rails should be tested after five years in track at least once each year for five years, then as often as a detector car is available after the rail has been in track ten years. However, here again two tests annually should give sufficient protection.

Track personnel should be instructed not to place non-con-trolled-cooled rails in track in controlled-cooled-rail territory be cause of necessity for more frequent testing schedule.

Continuous welded rails should be tested on the first trip of a detector car after the rail is laid to detect rolling or surface defects or defective welds. For subsequent tests on continuous welded rails, the pattern of testing for controlledcooled rails as outline above should be followed.

(Please turn to page 62)

# NEW QUESTIONS to be answered in December

Do you have an answer to any of the questions listed below? If so, send it in. Payment-based upon substance and length-will be made for each published answer. If you wish your name withheld, we'll gladly comply.

**DEADLINE: October 31** 

- 1. What factors determine when worn rail on curves should be changed out or transposed? Explain. When transposed, should the rail be turned? Why?
- 2. What weaknesses should an inspector look for when inspecting timber trestles? Explain. What tools

or equipment are necessary to make a proper inspection?

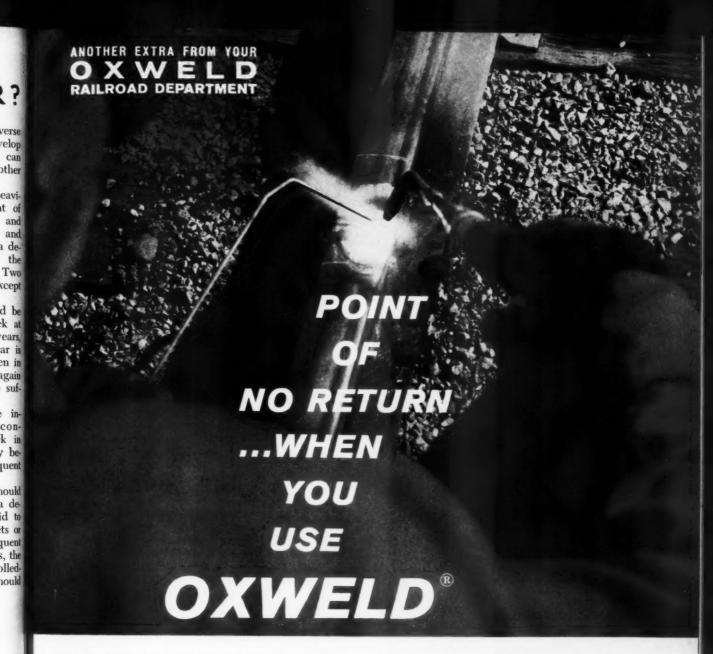
- 3. When picking up joints and smoothing track, is it good practice to raise a joint higher than the remainder of the rail? Why? If so, how much higher?
- 4. What problems are involved in the use of prestressed-concrete piles? Explain. How can cut-offs be made? Can splices for extensions be made? Explain.
- 5. Despite the rule-of-thumb that "more grinding and less welding" should be done in the care of man-

ganese frogs, improper grinding can be injurious. What is the proper procedure to be used when grinding? Explain step by step. What tools and equipment should be used? What kind of grinding wheels are best suited to this work? Explain.

Send answers to:

What's the Answer Editor Railway Track & Structures 79 West Monroe Street Chicago 3, Illinois

Do you have a question you'd like to have answered in these columns? If so, please send it in.



You won't have to go back—when you repair engine burns or battered rail ends with OXWELD rods and welding apparatus.

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# NTERNATIONAL CAR DIVISION

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# What's the answer? (cont'd)

# Cites results of survey

By L. L. SCHMUECKER Operating Manager—Rail Services Sperry Products Company Danbury, Conn.

Several years ago our company conducted a survey among railroads on this subject. Based on their replies, the factors, in order of importance, which influenced them to include control-cooled as well as non-control-cooled rail for testing

(1) Occurrence of defects (determined by complete test or spot-test with a raildetector car)

(2) Accumulative tonnage carried

(3) Age of rail

(4) Location of rail (main or secondary, curved or tangent track)

5) Occurrence of service failures (6) Class and speed of traffic

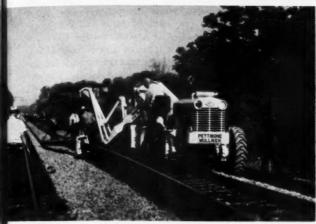
Based on 32 years of experience gained while testing more than 3.8 million miles of rail, Sperry Products Company endorses both the validity and importance of the factors as listed and recommends their use in establishing rail testing policies.

Prior to the advent of CC rail, most of the major roads tested new rail within the first 12 months after laying and annually, semi-annually, or more often thereafter as test results and other factors justified. With the advent of CC rail and its almost exclusive purchase and installation in the past 15 to 20 years, the timing of the first complete tests or spot-tests of such rail has varied between 1 and 5 service years.

The basic reason for this lies in the manufacturing processes involved and the composition of the steel as well as the factors listed above. Briefly, in non-CC rail, the nucleus of transverse fissures and certain other defects originated internally at the time the rail was manufactured and was present when the rail was laid in track. Development of the defect and its growth started as soon as the rail was subjected to traffic.

The control-cooled process practically eliminated the source and cause of transverse fissures, but CC rail in turn is plagued, in general, by another prevalent and possibly even more dangerous defect-the detail fracture. Unlike transverse fissures which originate from an internal source, the detail fracture usually starts from an external source, most-

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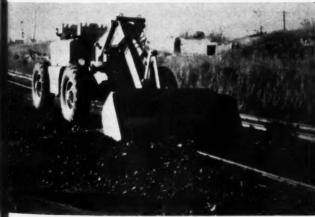
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- Forks
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# What's the answer? (cont'd)

ly from shells and head checks. The latter defect develops as a rule in one to five years time, depending on location in track, traffic, and track and roadbed conditions. Since these factors vary considerably from one road to another, detail fractures may present a greater problem in less time on some roads than on others.

Aside from number and rate of development, the detail fracture in CC rail poses a special problem. Records disclose that of all defects the detail fracture has the highest rate of failure while it is small in size. Complete rupture from a 15 per cent or 10 per cent defect is not uncommon. For this reason early spot tests or complete tests of such rail is quite important. Once the occurrence of defects is established, regular testing of CC rail is just as important for safety of operations as regular testing of non-CC rail.

Considering the above, it becomes evident why most railroads list "occurrence of defects" as the No. 1 factor in establishing test policies for CC and non-CC rail and their placement of "occurrence of service failures" in fifth place on the above list. They recognize that unknown numbers of defects are usually present in various sizes and stages of development long before actual service failures occur. Waiting for the latter to happen before scheduling a test is like waiting until one is sure he has cancer before calling a doctor to establish its severity.

The only known protection against hidden cancerous rail defects is regular testing geared to the railroad's particular needs and based on rail, track and traffic conditions. Such testing relieves doubt and provides assurance that the rail is sound and fully capable of performing its loadcarrying functions without fear of failure. Also, properly studied, analyzed and related to other known factors of a given railroad, test results can form a practical, economical basis for planning future test needs, including test locations and test frequencies.

While the above comments are related directly to defects outside the joint-bar area, any realistic rail-testing program must give due consideration to the detection of web defects within the joint-bar limits. Factors listed by railroads are just

as valid for this type of testing and are even more applicable to joint defects in CC rail. The latter, according to AREA statistics, accounts for an average of 46 per cent of all detected and service failures in joints while comprising only about 25 per cent of total track mileage tested. AREA statistics for 1958 disclosed a total of more than 21,000 joint defects (detected and service failures) compared with slightly more than 24,000 TD's (detected and service failures).

Joint defects for various reasons can and do develop in great numbers and quite rapidly without regard to type or age of rail. Again, to determine if a joint-defect problem exists, and to evaluate its severity if it does exist, it is advisable to schedule a spot test or a complete test as indicated and justified by service conditions and other factors on a particular railroad.

### Number of factors involved

By R. D. SIMPSON Maintenance Engineer Norfolk & Western Roanoke, Va.

The important factors to be considered in scheduling operations of a rail detector car are age of rail, traffic density and types of rail defects peculiar to the lines to be tested.

All rail that has been in service one year or more should be tested. While the detection of defects in rails with 12 to 18 months of service is comparatively rare, defects such as detail fractures under shells and engine burns will develop in that length of time.

The incidence of defects, and their growth, is directly proportional to density of traffic. It is, therefore, obvious that more frequent operation of detection equipment should be made over heavy-tonnage lines. Annual inspection of light-tonnage lines is sufficient but, in heavy-tonnage territory where growth of defects is rapid, tests should be made semi-annually. Past experience is the best guide in determining frequency of tests.

A determining factor for the inclusion of rail in a testing schedule is the type of defect that can be expected in any given territory. To illustrate, it is very important to test rail in territory where shelly condi-

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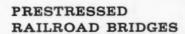
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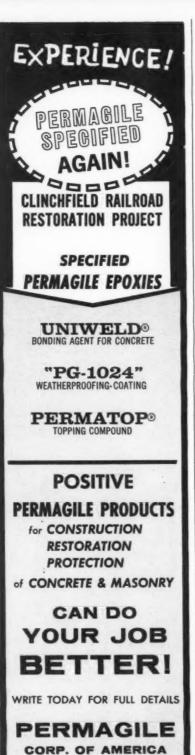
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# What's the answer? (cont'd)

tions exist. Such rail presents a hazardous condition in that a dangerous defect may develop under a comparatively small shell. On the other hand, large shells which may appear dangerous from their exterior appearance may not develop a fracture underneath.

Control-cooled rails should be included in the test. While transverse fissures are practically eliminated by the use of control-cooled rail, this feature has no effect on the development of other types of defects.

# Check previous test records

By E. L. Anderson Chief Engineer (Ret.) St. Louis-San Francisco Springfield, Mo.

Factors to determine the rail-testing program should be: (1) Age of rail as to service and tonnage carried annually; (2) record of defects found on previous tests; and (3) record of service failures, if any.

Under normal conditions the age or years of service of the rail have very little to do with the decision. However, the tonnage carried annually is an important factor. If the rail has carried as much as 100 million gross ton miles, tests should be made even though there have been no service failures. This applies particularly to rails being tested for the first time. Subsequent tests would then be predicated on previous test records.

Previous test records are very important on follow-up tests since these records indicate the rapidity of growth of the defects. Determination can largely be made as to the optimum period between tests from these records.

Service failures, if any, should take precedence over both of the above. If service failures occur previous to any test having been made, then a test should be arranged immediately. If service failures occur between test periods, then the period should be shortened.

Control-cooled rails should be included in the test. While it is evident control-cooled rails are not subject to defects to the extent non-control-cooled rails are, they should be tested under the same standards as outlined above.

Railroads today can ill afford not to throw every safe-guard possible around rail and its accessories. This is true from a satisfied-customer standpoint as well as from a monetary standpoint.

# Labor turnover in small gangs

With today's compact, mechanized track and bridge and building gangs, is labor turnover higher or lower than formerly? What are the reasons for this change?

# Lower than formerly

By W. M. MARTIN Division Engineer Maine Central Bangor, Me.

With today's mechanized gangs, labor turnover is much lower than formerly. One reason is there are less men working now since we were able to make a large labor reduction with the advent of mechanized equipment. Most of the men working now have considerable seniority. We have had some retirements but their jobs were filled with furloughed men who also had considerable seniority. Without a doubt we will not have any furloughed

men left in another five years and we will have to hire new men. Evenif we had to hire new men at the present time I would not expect too much turnover, since at present our lowest paid laborer is making 90 cents an hour more than a common laborer on the outside. We would be able to secure the men and also could afford to be very selective in picking them.

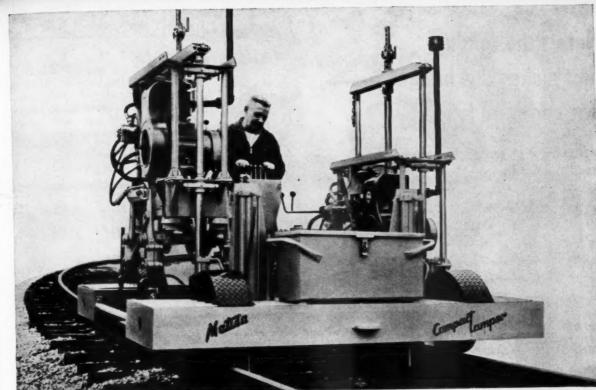
The only trouble that we seem to have is securing new men for jobs of short duration, that is, that last only for a week or two. If there are any laborers available they would rather stay home and draw unemployment, or "rocking chair pay" as

THE experienced pioneer

34-43 FIFTY-SIXTH STREET

WOODSIDE 77, NEW YORK

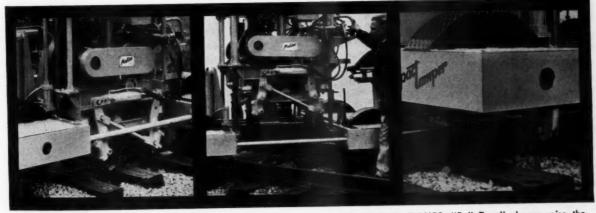
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ONE-MAN OPERATION, INDE-PENDENTLY CONTROLLED TAMPING HEADS. Fork-type tamping tools plus vibratory compaction allows fast penetration—even in highly cemented or foul crib conditions.

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FAST SET-OFF. A large hydraulic jack located in the center of the Matisa Compact Tamper quickly lifts it clear of the rails. Machine is easily turned by one man onto set-off rails.

HYDRAULIC RAIL CLAMPS. "Ball Type" clamps raise the track to grade and cross-level. Clamps work independently or together. Note easily replaceable clamp "shoe" eliminates wear and replacement of entire assembly. Hydraulic jacks work independently or together in coordination with hydraulic, ball type rail clamps for lifting rail.

Now, the time-proven, fast vibrating-squeeze-tamping principle of the Matisa Tamper is available for spot-tamping and smoothing operations, same as on heavier production models.



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RAILWAY TRACK and STRUCTURES

September, 1961

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This fully patented sprayer is in use on such prominent roads as the Pennsylvania; Southern; Lehigh Valley; Western Maryland; Jersey Central; Bessemer & Lake Erie; Louisville & Nashville; Delaware & Hudson; Florida East Coast; Seaboard; Norfolk & Western; and others.

This completely equipped Patton Sprayer headed for big jobs on a big Eastern road.

Patton Sprayer hooked on to truck ready for fast transportation to job site . . . . picture shows how booms can be extended to permit operator's stage to be lowered be neath deck.



Special features of the Patton B & B Sprayer include: retractable flange wheels; thermostat-control for warming coating; 125 c.f.m. air compressor with connections for any pneumatic tool; adjustable booms for hanging stages. It is so efficient that one big road needs but three Patton units to protect 12,000 miles of track. Write, wire or phone today for details on how you can reduce painting and deck coating costs!

# THE ROY C. PATTON Company

P. O. BOX 171. JACKSONVILLE BEACH FLA. Phone Cherry 6 2454.

# What's the answer? (cont'd)

one of my track supervisors calls it.

There also has been less turnover in our "floating crews." I believe this is due to better working and living conditions combined with power tools and proper equipment with which to work.

# How to dewater cofferdams

When sheet piles have been driven around a pier to make underwater repairs and water enters faster than the pumps can dewater the area, what can be done to make the cofferdam more watertight? Explain. What other measures can be used?

### Cement and sawdust

By R. E. NICHOLS General Foreman B&B Frisco Chaffee, Mo.

I have used cement and sawdust very successfully in making the joints of sheet piling watertight. This has been accomplished by constructing forms out of 2 by 4's, placing them over the joints of the sheet piling and filling them with dry sawdust and cement. When the sawdust becomes wet, it forms a watertight joint which has proved satisfactory in my work.

### Several methods

By A. B. WANG B&B Supervisor Monon Lafayette, Ind.

Such a condition would usually only occur in one spot or a few spots due to uneven rock or hardpan, or boulders

With the water pumped down, sand bags should be lowered carefully on the outside of the sheet piling in an effort to have the bags drawn into the leaks. Cinders can be rammed into the sheeting joints to seal them if the sheeting strikes



TIE PLATE LOCK SPIKE

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# BERNUTH, LEMBCKE CO., INC.

420 Lexington Avenue New York 17, N. Y.



# Brush to 6½" Trees Cleared 21' on Both Sides of Track with New Chain Saw Brush Cutter

Two years of research, engineering and field trials by Northwestern Motor Co., Eau Claire, Wisconsin, has resulted in the development of this fast, labor saving method of clearing brush and trees.



This completely new Brush Cutter using 7 ft. chain saws mounted on pantograph arms that reach out up to 21 ft. from the center of the track to cut brush and small trees up to 6½" in diameter has many obvious advantages over old types using circular saws or sickle bars.

The unit is powered by a 56 H.P. air cooled gasoline engine with hydraulically controlled motive and sawing power. Traveling speeds range from 0 to 35 M.P.H. and work speeds from 0 to 5 M.P.H. Either operator can control the speed and direction of travel by means of a single foot pedal accessible to each.

Each operator controls one saw and its set of pantograph arms through a group of five valves. Two valves control the two pantograph arms, a third valve swings the entire



pantograph horizontally through a thirty degree arc, a fourth valve controls the vertical angle of the saw to conform to the terrain and the fifth valve turns the saw on and off. In addition, when heavy cutting is encountered, a reciprocating action can be imparted to the saw by means of a switch. This moves the saw back and forth 2" each second.

The hydraulic saw motors operate at 2500 RPM to drive the saw chain at approximately 4200 feet per minute. A number of lubrication fittings at the rear of the chain provide the heavy lubrication required to prevent wear and heat build up. The flow through these fittings can be increased so that a weed and brush killing chemical can be added to the lubricating oil to spray the freshly cut growth, thereby eliminating a separate spraying operation.

The Northwestern Brush Cutter weighs 10,300 lbs. and is equipped with a setoff turn table for easy removal from the track. It has 21/2'' axles and 16" cast steel wheels, each with a



brake shoe and cast iron liner for emergency braking and parking. The engine has a 12V. starter-generator from which accessories such as lights, horn, etc., can be operated. The entire unit is protected by a pipe framework and heavy gauge sheet metal roof to prevent falling trees from injuring or damaging the operators or machine.

For complete details and specifications on the new Northwestern Brush Cutter write, wire, or call,

### NORTHWESTERN MOTOR COMPANY

Eau Claire, Wisconsin, U.S.A.

an obstruction. If this fails, I would then lower bags of dry sand and cement, with calcium chloride added. In such cases bags would do more good inside of the sheeting.

If the above methods did not work, or in cases where gravel in the excavation is permitting seepage. I would use the tremie method In this method the water should be permitted to rise to full height in the cofferdam. Then use a hopper to receive the concrete and an attached flexible tubing of 6 or 8 in. in diameter, with enough length to touch bottom, to deposit the concrete. By starting the deposit at the best end of the excavation and always keeping the tube down in the concrete so that no water will rise in it, this procedure would seal the area with only 12 to 18 in of concrete. Allow the concrete to set, then pump out the water.

If the length of the sheeting required is not too long, wood threeply interlocked sheeting could be driven. This gives better seal at the bottom. The ends of the sheeting should be cut wedge shape.

Another possibility, although it is expensive, would be to use double steel or wood sheeting and puddle the space between with clay.

### Try cinders first

By E. E. Runde Chief Masonry Inspector Illinois Central Chicago

Leaks in a steel sheet-pile cofferdam are most generally caused by leakage through the sheeting interlocks, leakage from the bottom due to porous soil or around old piles, or separation of the interlocks due to striking an obstruction when driven.

Leakage through the interlocks can be stopped quite easily by dropping a few cinders on the outside. The flow of water through the interlock will pull the cinders into the interlock and effectively seal the leak. To accomplish this, of course, it is necessary that the water inside the cofferdam be slightly lower than outside to assure a definite flow to pull the cinders into the interlock. The cinders will float away or sink to the bottom when the water pressure is equalized. Therefore, if the



# No Other Anchor Offers All These Advantages!

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No anchor has more holding power than the UNIT and few are its equal.

Most Economical

Low in first cost, UNIT gives you more for your money.

• Greatest Reapplication Value

UNIT anchors can be reapplied repeatedly with minimum loss of holding power.

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ELECTRIC PLANTS . AIR-COOLED. ENGINES . PRECISION CONTROLS

# What's the answer? (cont'd)

dam is allowed to fill over night it will be necessary to repeat the operation each morning.

If the leakage is from the bottom, it is most generally because the sheeting is not driven deep enough. If driving the sheeting deeper still does not allow dewatering it may be necessary to install a well-point pumping system or pour a concrete seal by the tremie method.

Leakage caused by separation of the interlocks can best be remedied by pulling the damaged sheeting, removing the obstruction and driving new sheeting in the place of the damaged sheeting. If the interlocks have separated at or slightly above the planned excavation depth, a tremie concrete seal would stop the leakage, but the sheeting may be very difficult or even impossible to remove.

The cinders method should always be tried first, as it is the most easily and economically accomplished method and in most cases will solve the leakage problem in the cofferdam.

No matter what the size of the cofferdam being dewatered, one should always have at least one large-sized pump to do the initial dewatering quickly and one smaller-sized pump to keep it dewatered.

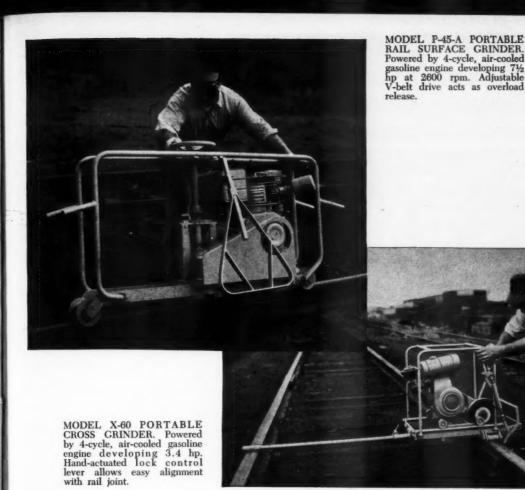
### Stop bottom seepage first

By H. Bober Bridge & Building Engineer Gulf, Mobile & Ohio Mobile, Ala.

Water enters a cofferdam through the spaces in the locks of the steel sheet piling and sometimes also comes up from the bottom.

Bottom seepage is the most serious since it increases as the cofferdam is pumped down due to increased hydrostatic head. It also carries with it sand or soil in supension, gradually eroding the footing of the cofferdam. If continued for a sufficient length of time the erosion will reach the bottom of the sheeting and the cofferdam will "blow in." This form of seepage must be stopped first.

There are several effective methods of stopping bottom seepage. Often it can be accomplished by driving the steel sheet piling deep-



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These light weight, portable grinders are ideally fitted to your one-man rail end and joint grinding jobs. They do the job faster, with less operator fatigue. Vibration is reduced to a minimum because the engines are mounted on rubber bushings. Designed for long life at low initial and operating cost, they give greater accuracy in performance with a minimum of skill and effort. Their portability makes them especially useful for maintenance work in heavy traffic areas.

Model P-45-A, a cup wheel grinder, is mainly used for grinding welded rail ends and for removing mill tolerance and mill scale before

heat treating rail ends. It leaves a very smooth and highly polished surface.

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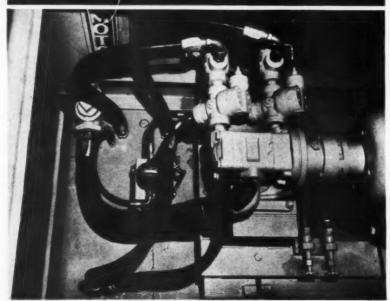
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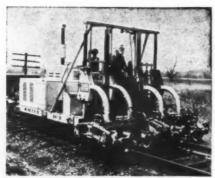


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#### What's the answer? (cont'd)

er. Usually 5 ft more of driving will stop it.

In very porous soils or in quick. sand in deep rivers it is often impossible or too expensive to stop this bottom seepage, and the cofferdam excavation is completed by clamshell without pumping. Then the entire cofferdam area is sealed with concrete through a tremie or metal pipe. This operation will have to be done with much care and the tremie handled so that there is a slow but constant displacement of water by concrete without any violent mixing, which would wash the cement out of the concrete. After the seal has set sufficiently, the cofferdam can be pumped out without diffi-

When seepage into a cofferdam enters through the sides, it can usually be quickly cured by dumping ashes or cinders around the outside edges of the sheet piling while the pumping is going on. The action of the pumps drags this material into the spaces of the sheet-pile locks. Larger leaks can usually be cured by driving strips of soft wood into the crevices.

With modern lightweight pumping equipment it is usually easy and inexpensive to quickly add another pump, if dewatering by one pump is not successful. However, this indicates excessive leakage and it has to be properly taken care of.

There should be sufficient space between the sheet piling (and waling) and the forms for the pier so that seepage water will be away from freshly poured concrete to prevent cement from being washed out A sump should be built at the lowest point of the cofferdam for the suction hose of the pump. The pump should be equipped with a check valve and strainer.

On rare occasions, where no other means succeed, it may be necessary to build a second cofferdam around the first one, filling the space between the sheet pile walls with an impervious material, such as clay. This is, of course, expensive.

As in most matters of engineering or construction work, the location and size of the cofferdam and the characteristics of the soil into which it is driven are the determining factors and judgment and experience will decide the proper answer.

## Effective work time between trains

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Where track gangs must get in the clear for trains, how much ontrack time should be available between trains to justify moving the machines out of a side track?

#### Grab the few minutes

By F. R. MICHEAL Assistant Chief Engineer Wabash St. Louis, Mo.

Track machines should occupy the track whenever there is sufficient time to set up the organization and complete even a few minutes work. Track gangs should keep the machines working every available minute.

The advantages of such a close working program are:

(1) It alerts the dispatcher that the organization can move quickly and that the gang should be given the opportunity to occupy the track every minute possible.

(2) It alerts the gang into a live, active group that expects and is ready to move upon the passing of each train, avoiding anticipated loafing and making for fast reorganization of the gang when machines are returned to work site.

(3) It permits taking advantage of all unexpected delays to trains following the one just cleared and places the gang in a position to take advantage of any revision in train figures.

(4) It results in maintaining a lively, well-organized group that gains the respect and cooperation of the operating department.

#### **Need one hour**

By H. C. CULBERSON Supervisor of Track Western Maryland Hagerstown, Md.

In your reference to machines, I am presuming you have in mind a line-and-surface and tie-renewal operation. In my experience with this type of operation, I find one hour's working time is needed to justify moving out of a siding.

In most instances, when trains are moving on close schedules, we









Big Boy Conversion unit shown mounted on one of eight trucks recently delivered to a leading Western Railroad.

## BIG-BOY Rail Road CONVER Moves Heavy-Duty Equip

Heavy vehicles, equipped with Big Boy Rail-Road Conversion Units, save time and labor costs by getting men and machinery to and from job sites. The Big Boy has proved itself in actual operation in such diversified applications as:

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Electric Tamper Export Co. 205 W. Wacker Drive Chicago 6, Illinois

close up for the first train, working very near his schedule and, on the last 10 or 20 rail lengths, every other tie will be tamped. After the first train has passed, the tamper only will be moved out of the siding and tamping will be completed to the run-off. This aids production and provides work between trains.

If train schedules are such that it is impossible to get more than one hour, or only slightly more, at one time in a working day, the work schedule should be changed so that it is possible to clear on a much shorter notice. This may necessitate splitting operations into a timbering gang and a tamping gang.

#### Consider off-track machines

By P. A. Cosgrove Division Engineer Illinois Central Champaign, Ill.

It is my opinion that a track gang should have at least one hour of track time available in order to justify moving machines onto the main track to perform work. If less than one hour is available, it is better for the "on-track" outfit to remain in the clear. If trains are of such density that the "on-track" outfit must clear trains too often, then it is better to give consideration to "off-track" type of equipment.

#### Depends on work

By L. G. LAWSON Roadmaster Canadian National Melville, Sask.

When track gangs must get in the clear for a train, the amount of time available before the next train arrives certainly governs the performance of the gangs.

The amount of time required between trains to make it worthwhile for again starting the work depends

on the distance that the machines have to travel, the speed in which the gang can open up and the planning of the work so that as little time as possible will be lost.

As nearly all our machines can be taken off the track on stands made for this purpose, it does not

(Continued on page 80)

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RUCTURES

• For product information

• For free literature

Check over the items below and on the other side of this page. They refer to products described or advertised in this issue, or to free literature offered by manufacturers. If you desire additional information about any of the products, or copies of the literature, circle the corresponding numbers on one of the cards, and drop it in the mail after typing or printing your name, etc. With one card you can get information on all the items listed.

#### Products offered by advertisers

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101. Bethlehem Roof Bolts—Designed to minimize danger of roof falls in tunnels. (Page 3)

102. CP Air Tools—Describes impact wrench, masonry breaker, nail driver and scaler. (Page 4)

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104. Hydraulic Tie Bemover-Model W68B is self-propelled and is operated by one man. (Page 8)

105. Model W87B Tie-Bed Scarifier
—Says unit digs one 10-ft tie bed a
minute, (Page 8)

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107. Medel W90A Tie Handler-Designed to remove, insert and reposition ties. (Page 8)

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116. Self-Propelled Spike Puller—Says 2-man unit can pull 30 to 45 spikes per minute. (Page 16)

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118. Hydraulic Spreader-Ditcher—Says control system gives smooth, positive operation. (Page 20)

119. Track Maintenance Equipment
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120. Chlores Cranular—Pelletized combination of three chemicals for vegetation control. (Page 23)

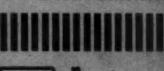
121. Woolsry Wood Burners-Describes four types of self-propelled and trailer-type units. (Page 28)

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131. Compact Tamper-Has independently controlled heads for spot tamping, smoothing work. (Page 67)

132. Patton "Allweather" Coating— Says material extends bridge life by one-third. (Page 68)

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134. Northwestern Brush Cutter— Chain saws mounted on pantograph arms cut 6½-in trees. (Page 70)

135. Model P-45-A Rail Surface Grinder-Portable machine is designed as a cup-wheel unit. (Page 73)

136. Prestressed Concrete Piling— Stocked in lengths from 30 to 75 ft in 5-ft increments. (Page 75)

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149. Lubrication Guide-Gulf Offers 38-page illustrated booklet of the lubrication and maintenance dengines, air tools, wire rope, an earthmoving equipment. Railroadmen will find information very heful. (Page 24)

150. Cost Record Books—Keep records of performance of individual grading machines. (Page 53)

151. Armoe Steel Buildings-Offer to furnish information on new lisof structures. (Page 58)

152. Expansion Plates and Bushing—Manual 55 gives data on Lubric self-lubricating units. (Page 75)

153. Hayoo Shock-Free Head-Cacular 115 describes extension for bumping posts. (Page 79)

154. Track Equipment—New catalog shows entire railway line of Noise Company. (Page 70)

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903. NCG-Ameler Track Inspecting Car-Mobile laboratory for descriptions (Page 50)

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"At numerous places along our right of way it is impossible to approach with a truck, hence the use of the Nolan Tool and Supply Car for jacks, spot tampers, ties, track jewelry, and lengths of rail.

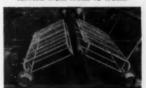
"These cars are versatile, light, sturdy, clean, easily handled and quickly placed on and removed from the track. They embrace economy as well as safety."

Sufely handles loads to 2000 lbs. All tubular high-carbon steel construction for trouble-free service. The deck is heavy mesh-expanded steel. Removable handle can be used at either end. Ball bearing cast steel wheels.

Platform Size 48" x 45" Height Above Rail 8" Weight 140 lbs. complete



NOLAN Tool and Supply Car easily carried from truck to truck.



Easily and safely locked together



Ready to roll to job site with

FREE complete NEW catalog shows entire NOLAN railway supply line.

THE NOLAN CO., 166 Pennsylvania St., Bowerston, Ohio

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## EPOXIES are TOUGH

Outstanding applications for the Railroad Industry



THE ONLY
COMPLETE EPOXY
SERVICE

Coatings—Concrete and Masonry Surfacing Compounds— Mastics for Adhesive Filling and Caulking

See us at the
ALLIED RAILWAY SUPPLY ASSOCIATION SHOW in Chicago
at the Hotel Sherman, Booth #36. Sept. 10-13
Write for illustrated specifications folders.

THE CLINTON COMPANY

Pioneering Quality Industrial Finishes Since 1928
1210 ELSTON AVE. CHICAGO 22, ILL. PHONE: ARmitage 6-7760

Breaking air hoses at bumping post?

Hayco Head, with pat'd Shock-free® design, installed in minutes, gives needed clearance.

The 12½" extension on the bumping post (compressing to 8¾") provides ample clearance for all types of cars.

In addition, the unique Shock-free design of The Hayco Head cushions the car and lading, protects and saves the bumping post.

Hayco Heads have now been in daily use for 6 years. They save money in operations and in track-end maintenance. Write for Cir No. 115.



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The Brice Hayes Co.

6710 NORTHWEST HIGHWAY CHICAGO 31, ILLINOIS



Four Standard recommended sizes are normally stocked for prompt delivery. Non-standards up to size %" x 12" supplied on short order.

Bulletin on request.

#### Howard & Gould Co

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Send me full information and a free sample lesson for the course I have checked below.

Railway Sup	pervision
Locomotive	Electricia
Locomotive	Machinist
Car Inspect	for
	Locomotive

	way signaling
Name	
RR	Job

Zone\_State

What's the answer?

(Continued from page 76)

pay to run more than two miles at the most to a siding. However, if only one or two trains have to be cleared in a day the gang can always be assigned to some useful and necessary work and the machines can then go several miles quite easily to a siding with little time lost.

Under flag protection, we usually let a train approach the outer signal or the flagman before running to a siding away from the approaching train. Where possible, we have a man monitoring on the dispatcher's phone and know within a few minutes when a train is approaching. In this manner we have the most on-track time possible.

When ten or so trains have to be cleared in a day, which is a frequent occurrence on our main line, every minute of on-track time must be used. In such cases we work as close to a train as we possibly can. Also, we will work for only short periods between trains.

For ballast work, 30 min provides sufficient time between trains to warrant putting the machines on the track or to leave the sidings. For ballast work where a ballast sled is used. I would say that at least one hour must be available between trains to make it worthwhile to start the sled again. For steel gangs, especially when laying continuous welded rail, one must have at least 45 min to make it worthwhile to start work, as it takes that long to get reorganized and lay one string.

"The ties having the cracks have been left in the track for further observation as they are as strong structurally as uncracked ties. In addition, the spacing on about 20 uncracked or new ties was reduced from 30 in to 20 in. On several of the uncracked ties spaced at 30 in the ballast was removed, as much as possible, from under the center portion of the tie. The condition of these ties will be closely followed to determine if either method is the solution.'

Are railroads with test installations of concrete ties contemplating further installations? Here's what Mr. Hutcheson has to say:

"We have been considering the use of prestressed concrete ties for some of our new yard tracks and also in highway crossings at grade where concrete slabs would carry the highway traffic. We have not definitely decided, however, to just what extent we will expand our use of the ties.

As for the Western Pacific, says Mr. Woolford, our next test will probably be on the main track, provided we can solve the insulation problems that will be confronting us in CTC territory; if not, we will conduct our test outside of signal areas. We are hopeful we can work out some arrangement with the fabricator, Ben C. Gerwick Inc., whereby we will undertake a joint test in the future, installing about 100 to 200 ties on the main track.

"I definitely think we are justified in conducting additional test installations insofar as our main track is concerned . . .

#### Concrete ties

(Continued from page 39)

cent of the axle load as the tie cannot be depressed a sufficient amount to distribute the load to other ties.

The center portion of the tie was designed to have a wedge-shaped cross-section with a rounded bottom edge. The purpose of this cross-section is to produce a minimum bearing on ballast at the center portion and thus reduce the centerbinding of the ties. This feature works in normal track, but with only about 4 in of ballast the sloping sides and round edges of the center portion cannot compress or work into the ballast a sufficient amount.

#### CLASSIFIED **ADVERTISEMENTS**

#### ADD DOLLARS and EXPERIENCE

to your operation. Desire investment opporto your operation. Desire investment oppor-tunity and active participation with estab-lished railway supply firm. Write Box 33, RAILWAY TRACK & STRUCTURES, 30 Church Street, New York 7, N. Y.

#### FOR SALE

Model 15 Burro Crane, overhauled, in good condition. Available at once.

Wm. A. Smith Contracting Co., Inc. 1401 Fairfax Trafficway AT 1-6370 Kansas City, Kansas

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(Continued from page 56)

ates ahead of the Super Jack-All. The operator sights through the telescope, over a target mounted on the jack tamper, to a target pulled behind the latter on surfaced track. The telescopic sighting device permits the operator to work at varying distances from the Super Jack-All for accurate sighting on tangent track, around curves or over humps. Kershaw Manufacturing Company, Dept. RTS, Montgomery 1, Ala.

(Circle 207 on TIME-SAVER card, page 77)



Electricity used for . . .

#### Incinerating toilet

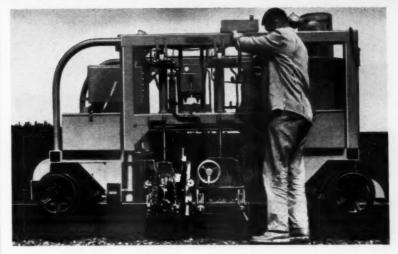
HUMAN WASTE can be quickly and easily disposed of by a new electrically operated incinerating toilet, it is claimed. Known as the Incinolet, the toilet is recommended for work cars, trailers, warehouses, isolated work areas where water flush systems are difficult or too expensive to install and at locations where water systems might freeze. The manufacturer states that the unit is completely sanitary since waste is reduced to inorganic ash in a matter of minutes and that it is free from unpleasant odors. The latter is accomplished, it is claimed, by a permanent, built-in, heat-activated catalyst, known as Candor, which breaks down odor molecules below the threshhold of smell. The Incinolet is installed by bolting to the floor, installing a vent and attaching the unit to an electrical source. Research Products Manufacturing Company, Dept. RTS, Dallas 35, Tex.

(Circle 208 on TIME-SAVER card, page 77)

Spray under bridges with . . .

#### Granular applicator

A NEW air-operated device is available for spraying granular herbicide around both sides of a bridge, and underneath it, at the same time. It operates from the track and consists of a tank, an air-pressure



#### Lay steel with less manpower

### RACINE Rail Drill & Saw

Cuts rail, drills three holes at same time

Whether you lay ribbon or jointed rail, you'll speed your steel gang and save at least 2 men with new Racine Rail Drill & Saw. This allin-one, self-propelled machine saws and drills rail for insulated joints and turn-outs, fast and true . . . semi-automatically. Here's how:

Operator drives the Drill & Saw to location at 20 mph...steps down, and spots machine exactly over the cut-mark with push-buttons. He lowers the saw hydraulically, turns handwheel tight, and starts the mist-cooled saw. Then gauging precisely from saw-cut, he lowers the 3-bit drill, turns another handwheel and starts drill. When completed, he re-positions machine and accurately drills the other rail-end.

#### Joints rail-after-rail identically

The new 3-bit drill unit may be pre-set to drill holes 51/2" to 7" centers for any size rail and angle bars. It aligns automatically, drills absolutely true as set. The saw unit is adapted from Racine's proven portable rail saw. Outlets provide electricity for impact wrench, bit sharpener, work lights, grinder, etc.



New 3-bit drill available rately for on-track op-on from generator set, rith gas engine.

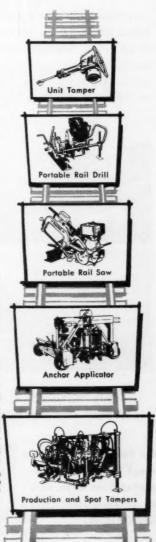
For in-track cropping, too

This machine is basically a carriage and power plant for electric saw and drill units. It is also available with longer frame and multiple saw and drill units to suit your needs for in-track rail . RR-121 cropping.

Write for free information and location where you can see Racine machines at work. Write to:

**Racine Hydraulics** & Machinery, Inc. RACINE Dept J251 Racine, Wisconsin







## NOW . . . Cut M/W costs to the bone by Lease or Purchase of MANNIX "Auto-Track" Equipment

Any R.R. crew can easily be trained to operate the simple, reliable MANNIX "Auto-Track" equipment. By having it available at all times, through lease or purchase, your maintenance work can be scheduled for maximum efficiency and economy. You can rehabilitate more miles of track with fewer men using MANNIX "Auto-Track" equipment.



Only one man and the Auto-Track operator are needed to position the Plow or Sled under the track or to take it out.



Aligning unit keeps track in alignment behind both Plow and Sled. Worn ties are knocked off by hydraulic hammers, ejected to one side automatically.

Over 6000 miles of track rehabilitated on 33 railroads has proved that the Mannix Method saves money and time.

For full details or to arrange a showing of operating films write, wire or phone TODAY. NO OBLIGATION.



#### Products (cont'd)



regulator and two hoses with nozzles. The new granular applicator operates from an air-compressor, furnished by the railroad and is designed to spray any make of granular herbicide at the rate of 25 lb of material per minute through each hose. It is capable of spraying herbicide for a distance of up to 45 ft from the track on each side of the bridge.

The tank of the device holds approximately 350 lb of granular material under pressure. It and the air compressor can be mounted on a push car and pulled along the track by a motor car. A 60-cfm compressor is required when spraying is to be done out of both hoses at the same time. When only one hose is required a 35-cfm compressor can be used. The device is operated by 3 or 4 men when both sides of a bridge are being sprayed-one man operating the motor car, at about 2 mph during spraying, two men handling the hoses and another, optional, adjusting the valves on the tank and refilling the tank. The manufacturer states that the apparatus can be calibrated to deliver any predetermined number of pounds of granular herbicide per acre. Pepco Engineering Products Corporation, Dept. RTS, 162nd and Vincennes Ave., Harvey, Ill.

(Circle 209 on TIME-SAVER card, page 77)

#### **Biographical briefs**

(Continued from page 10)

the latter year he was promoted to senior civil engineer on railway valuation for the ICC. Mr. Crosland entered the service of the Frisco in 1920 as an instrumentman, subsequently being promoted to assistant engineer, roadmaster, assistant division engineer and division engineer. During World War II he served as chief engineer, headquarters, Military Railway Service, U. S. Army. He was promoted to assistant chief engineer of the Frisco in 1946, also serving as chief engineer maintenance of way. Mr. Crosland was advanced to chief engineer at Springfield, Mo., in 1957.

John G. Carver, 24, who was recently promoted to assistant engineer of structures on the Missouri-Kansas-Texas at Denison, Tex. (RT&S, July, p. 10), was born at Gorman, Tex., and received his higher education at Southern Methodist University. He entered the service of the

Katy in 1955 as a cooperative engineering student. From November 1959 to December 1960 he served with the Texas & Pacific as a construction inspector. Mr. Carver rejoined the Katy in the latter month as assistant bridge engineer, the position he held at the time of his recent promotion to the position of assistant engineer of structures.

#### Supply trade news

AEROQUIP CORPORATION—Don T. McKone, Jr., vice president, has been promoted to executive vice president in charge of domestic manufacturing and sales operations for the company.

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AMERICAN BRAKE SHOE COMPANY—Eads Johnson, Jr., vice president of sales for the Railroad Products Division, has been promoted to first vice president of the division and Jomes R. Shepard, works manager, Brake Shoe Department, Railroad Products Division, has been promoted to vice president of manufacturing for the division. In addition to his responsibilities as first vice president, Mr. Johnson will continue to direct all sales of railroad products for American Brake Shoe.

Mr. Johnson has been with ABS since his graduation from Yale University in 1934, serving successively as special apprentice, railroad products sales representative, assistant vice president for one of the company's railroad supply divisions and division president. He was promoted to vice president of sales for the Railroad Products Division in 1957.

Mr. Shepard also is a graduate of Yale University. He joined ABS in 1937 and has served as special apprentice, in a number of responsible manufacturing positions and as district works manager. He was promoted to works manager, Brake Shoe Department, in 1957.

AMERICAN HOIST & DERRICK CO.—Percy 5. Gough, general sales manager of the company's Crosby-Laughlin Division, has been promoted to the newly created position of director of marketing for American Hoist & Derrick.

BIRD TIE PADS, INC.—C. C. Turner, Western States Supply Company, Omaha, Neb., has been appointed sales representative for Bird self-sealing tie pads. Mr. Turner maintains offices at 1517 Harney Street in Omaha.

(Please turn the page)







James R. Shepard

## Control brush this winter, spread your budget and workload with Amchem's new



DORMANT
CANE
BROADCAST
SPRAYING
with
TRINOXOL
AND
DINOXOL

#### THE TECHNIQUE

In dormant cane-broadcast treatment, spray stems so that good run-down to the root collar zone occurs. The spray is then broadcast to wet all aerial portions of the dormant cane.

#### THE RESULTS

This technique has proved successful in eliminating "brown out" on brush along roadsides, gives better control of hard-to-kill oaks and maples. By first spraying at the base of the stems, sprouting after the second growing season after treatment is greatly reduced.

#### THE ADVANTAGES

Dormant Cane Broadcast Spraying is Amchem's answer to a long needed utility brush control program that provides effective results, economical chemical usage and an all-around winter spraying season!

"Broadcast" treatment can be done any time from leaf drop to bud break, extends the spraying season to 8 to 10 months of the year! No minimum temperature is required to treat, and winter spraying does not damage susceptible crops. These advantages mean even more to you—like stretching your budget further, spreading out contractor's (or your own) workload and labor force. Cost? Easily comparable to waterborne stem foliage spray!

Remember the name—DORMANT CANE BROADCAST SPRAYING. Get the details!



#### AMCHEM PRODUCTS, INC.

Amchem is a registered trademark of AMCHEM PRODUCTS, INC. (Formerly American Chemical Paint Co.) AMBLER, PA. • St. Joseph, Mo. • Niles, Calif.

#### SAVE EXPENSIVE BRIDGE REPLACEMENTS



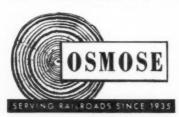
## Investigate LOW-COST OSMOSE IN-PLACE TREATMENT

Chances are, some of your wooden bridge structures now scheduled for replacement can be treated for many more years of safe, dependable service. The answer to this budget-saving opportunity is the new Bridge Inspection and Treatment Service developed by Osmose Wood Preserving experts.

Experienced supervisors conduct all inspection ... locate even the most remote decay and insect-infested spots, including hollow heart, groundline and drift pin trouble areas. Using modern wood preservatives and spraying methods, all timber receives thorough top to bottom coverage, plus groundline excavation and treatment.

Now, a new wood replacer compound that forms a continuous bond with wood is available to fill voids and weak surface areas for added strength and new safety.

Let Osmose review your bridge replacement schedule. The savings on one bridge alone will more than pay for the normal inspection cost. Call or write: Bridge Inspection and Treatment Division, Osmose Wood Preserving Co. of America, Inc., 989 Ellicott St., Buffalo 9, N. Y.



#### Supply trade news (cont'd)





Donald W. Waack Bucyrus-Erie

Vernon E. Pray Schield Bantam

BUCYRUS-ERIE COMPANY-Donald W. Wook has been appointed manager of sales promotion, according to a recent announcement. In his new position, Mr. Waack will be in charge of advertising, publicity, sales literature, photography, publications and sales aids. He previously was assistant sales development manager for the Schield Bantam Company.

CHICAGO PNEUMATIC TOOL COMPANY-Russell B. Miller, manager of the Atlanta, (Ga.) District, has been promoted to general sales manager of the company, with headquarters at New York. In his new position, Mr. Miller will be responsible for coordinating the efforts of the company's sales staff in the sale of air and electric tools, compressors, diesel and gas engines and rock-drilling equipment. He has been connected with CP for more than 25 years and has served at the company's Franklin (Pa.) manufacturing facility and with its sales department at Birmingham, Ala. Mr. Miller was promoted to assistant district manager at Atlanta, Ga., in 1939 and manager of the district in 1952.

COLORADO FUEL & IRON CORP.—Frank M. Barry, assistant to district sales manager, has been promoted to district sales manager, Northern California district. Thomas D. Guy, sales representative, Northern California district, has been promoted to assistant district sales manager of that district. N. H. Nordby, district sales representative, Butte, Mont., has been promoted to assistant district sales manager, Boise (Idaho) district.

MID-WEST FORGING & MANUFACTURING CO.—R. A. Corley has been appointed eastern representative, effective August 12, for the sale of Improved Gautier rail anchors, according to an announcement by Roy T. Johnson, Jr., executive vice president.

NATIONAL LOCK WASHER COMPANY—Albert Schiffers, Jr., has been appointed sales representative in Illinois, Indiana, Iowa, Michigan and Wisconsin, according to an announcement by J. V. Nurney, sales manager. Mr. Schiffers succeeds Eugene Harbeck, district sales manager, whose death was noted in the June issue.

The Holden Company, Limited, with headquarters at Montreal and branch offices at Toronto, Ont., Windsor, Vancouver, B. C.,

Winnipeg, Man., Calgary, Alta., and Moneton, N. B., has been appointed exclusive Canadian representative for this company.

R. S. Wilson, vice president of the Railway Division, will handle the RMC line of equipment for the Holden Company.

RAILROAD ACCESSORIES CORPORATION—E.
M. Deems, Jr., manager of sales, has been promoted to vice president, effective August 15, succeeding G. E. Dugan who has retired after 30 years of service with the company, according to an announcement by H. A. Scott, president.

SCHIELD BANTAM COMPANY-Vernon E. Pray, sales development manager, Waverly, Iowa, has been promoted to domestic sales manager, according to an announcement by Buel M. Wellis, vice president-director of marketing. In his new position, Mr. Pray will work directly with the company's domestic distributors and will also be responsible for the direction of the Sales Development Department, which includes advertising, sales promotion, sales training and a separate market research section.

Mr. Pray attended Bradley University and the graduate school of Sales Management and Marketing at Rutgers University. He joined Schield Bantam in 1949 as advertising manager, being promoted to sales development manager two years later.

#### Association news

#### Mississippi Valley Maintenance of Way Club

The opening meeting of the 1961-62 season will be held on September 11 in the Louis IX room, Fred Harvey Restaurant, Union Station, St. Louis, Mo. H. M. Hoffmeister, vice president, Missouri Pacific, will present the program which will pertain to IBM machines and their use in implementing maintenance-of-way accounting procedures.

The meeting will be preceded by a social hour starting at 6:00 pm. Dinner will be served at 7:00.

#### Research seminar to be sponsored by AAR and ARF

A seminar on Research and the Nation's Railroads, to be held on November 2-3 at the Sheraton Towers hotel, Chicago, will be sponsored jointly by the Association of American Railroads and the Armour Research Foundation.

Subjects to the discussed at the seminar include industry needs in equipment, right of way, signaling, communications and prevention of damage to shipments; solution of railroad problems through research in new materials, methods, designs and concepts of operations; and application of computers to railroad research problems. One of the speakers at the opening session will be R. H. Beeder, chief engineer, system, Santa Fe, who will discuss industry needs in right of way. W. M. Keller, vice president-research, AAR, will be chairman of the program.

MULTI-GANG UNIT consists of self-propelled Main Car with power downfeed tampers,
(1) Hydrillbolter, (2) combination Spike Hydrejector and Tie Hydrenewer, and (3) the
Comboliner, powered by 9-hp Wisconsins. Unit is made by Tamper, Ltd., Montreal, Quebec, Canada.



## S-T-R-E-T-C-H Your Maintenance of Way BUDGET DOLLARS

By Using



Ballast Cleaning Service

**Rail Grinding Service** 

Our contract arrangement for these services obviates the necessity for any capital investment on the part of the Railroads and protects them as to cost for this type of work.

We have been servicing the Railroads continuously for over 45 years and have yet to lose a customer.

#### THERE MUST BE A REASON FOR THIS

Tust Ask the Railroads That have used us!



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RAILWAY TRACK and STRUCTURES

#### COLD WAVE FORECAST!

... and it will be here before you know it. If your coach watering facilities are built around the FAMOUS-"840" sanitary's self-de-icing nonfreeze railroad hydrant, your worries about frozen water hydrants are over.

The FAMOUS-"840" is the preferred non-freeze sanitary hydrant designed specifically to perform a specific job for railroads — providing an uninterrupted supply of potable water for passenger coaches, dining cars and numerous other requirements.

Low first cost, ease of installation and maintenance are all available in Ken-Ray's FAMOUS-"840" sanitary self-de-icing non-freeze railroad hydrant.

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3' bury — \$130.00 4' " — 140.00

5' " — 150.00 6' " — 160.00

FOB Vermont, Illinois

Write for descriptive brochure.

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## In The Yard... on On The Line BURRO

#### **WORK POWER PAYS!**

When a BURRO goes to work—in the yard or on the line—it delivers fast, low cost performance. Equipped with bucket, magnet, hook, tongs or dragline bucket, a BURRO is ready and able to do the

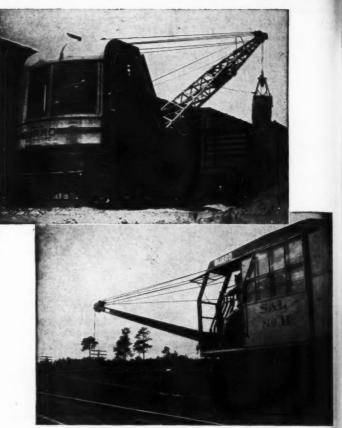
hundreds of odd jobs railroad work calls for. Fast travel speeds (up to 22 mph.) and heavy draw bar pull enable the BURRO to move itself and a work train or cars to the job in a hurry. Once on the job, a BURRO wastes no time getting the work done. BURRO's work power pays dividends every day it operates.

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## LENGTHEN

## TIE LIFE

BY SPOT TIE RENEWAL WITH KERSHAW

## Tie Saw AND Tie Bed Scarifier



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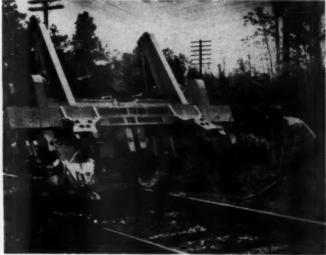
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The Kershaw Dual Tie Saw and Tie-Bed Scarifier with Tie-Inserter replace ties with a minimum number of men and machines. These machines fit into any retimbering gang. They require only two operators and three laborers to saw ties, remove the butts, scarify the tie bed and insert new tires.

#### ALL WITHOUT DISTURBING THE LINE OR SURFACE OF THE TRACK!

Which means, of course, that now you can have "spot" tie renewal if desired. You can inset 100 ties per mile in "spot" renewal gangs (or 500 to 700 ties per mile in track reconditioning gangs), and at a minimum cost.

Ties can be removed whenever you desire, so the necessity of throwing out ties which still have a year or more life is eliminated. By replacing ties every one or two years at a rate of 100 to 200 per mile, and increasing tie life one to two years, saving can easily run into hundreds of thousands of dollars.

P. S. Since ties can be renewed without disturbing surface, the Kershaw Tie Saw is perfect for yard operations and patching after de-railments.



# The Key To LONGER RAIL LIFE



**Headfree Toeless Joint** 



Headfree Flanged Joint





Armored Insulated Joint



Rajo and Compromise Joint

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**DIVISION OF POOR & COMPANY** 

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